Title: Supergravity Backgrounds from Generalized Calabi-Yau Manifolds (Part 2)

Date: Mar 02, 2005 11:00 AM

URL: http://pirsa.org/05030081

Abstract:

Torsion versus fluxes

Torsion: $dJ = \mathrm{Im}\,(W_1\,\Omega) + W_4 \wedge J + W_3$
$1 \oplus 1 \quad 3 \oplus \bar{3} \quad 6 \oplus \bar{6}$

$d\Omega = W_1\,J^2 + W_5 \wedge \Omega + W_2 \wedge J$
$1 \oplus 1 \quad 3 \oplus \bar{3} \quad 8 \oplus 8$

	$1 \oplus 1$	$3 \oplus \bar{3}$	$6 \oplus \bar{6}$	$8 \oplus 8$
Torsion	1 (W_1)	2 (W_4, W_5)	1 (W_3)	1 (W_2)
H_3	1	1	1	0
IIA: F_{2n}	2 (F_0, F_2, F_4)	2 (F_2, F_4)	0	1 (F_2, F_4)
IIB: F_{2n+1}	1 (F_3)	3 (F_1, F_3, F_5)	1 (F_3)	0

In IIB $W_2 = 0$ (integrability of complex structure) ↓ In IIA $W_3 \sim H^{(6)}$ (symplectic geometry)

If also $W_1 = 0$ → IIB: $d\Omega = W_5 \wedge \Omega$ $\quad \mathcal{M}_6$ is complex
(true in all susy vacua)

IIA: $dJ = W_4 \wedge J + H^{(6)}$ $\quad \mathcal{M}_6$ is "twisted symplectic"

Is there a mathematical construction that ~~extends~~ complex and symplectic geometry?

GENERALIZED COMPLEX GEOMETRY

Click to add notes

eneralized complex geometry

Hitchin
Gualtieri

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X + \zeta$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X + \zeta$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}$: $T\oplus T^* \to T\oplus T^*$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X + \zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}$: $T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

T $\qquad$ $T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X + \zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

T $\qquad$ $T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X + \zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

T $\qquad$ $T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X + \zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

	T	$T \oplus T^*$
ACS	J s.t. $J^2 = -1_d$	

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X + \zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

	T	$T \oplus T^*$
ACS	J s.t. $J^2 = -1_d$	

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X + \zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

	T	$T \oplus T^*$
ACS	J s.t. $J^2 = -1_d$	

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

	T	$T \oplus T^*$
GACS	J s.t. $J^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

	T	$T \oplus T^*$
GACS	J s.t. $J^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t\, I\, \mathcal{J} = I$$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X + \zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

	T	$T \oplus T^*$
GACS	$\tilde{J}$ s.t. $\tilde{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\tilde{J})$	

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X + \zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	J s.t. $J^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i J)$	

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X + \zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

	T	$T \oplus T^*$
GACS	$\tilde{J}$ s.t. $\tilde{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\tilde{J})$	

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X + \zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\mathcal{J})$	$\Pi_\pm = (1_{2d} \pm i\mathcal{J})$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X + \zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	J s.t. $J^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i J)$	$\Pi_\pm = (1_{2d} \pm i \mathcal{J})$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\mathcal{J})$	$\Pi_\pm = (1_{2d} \pm i\mathcal{J})$
Integrability	$\pi_\mp[\pi_\pm X, \pi_\pm Y]=0$	

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X + \zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\mathcal{J})$	$\Pi_\pm = (1_{2d} \pm i\mathcal{J})$
Integrability	$\pi_\mp [\pi_\pm X, \pi_\pm Y] = 0$	

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\mathcal{J})$	$\Pi_\pm = (1_{2d} \pm i\mathcal{J})$
Integrability	$\pi_\mp[\pi_\pm X, \pi_\pm Y]=0$	

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\mathcal{J})$	$\Pi_\pm = (1_{2d} \pm i\mathcal{J})$
Integrability	$\pi_\mp[\pi_\pm X, \pi_\pm Y]=0$	

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}$: $T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\mathcal{J})$	$\Pi_\pm = (1_{2d} \pm i\mathcal{J})$
Integrability	$\pi_\mp [\pi_\pm X, \pi_\pm Y] = 0$	$\Pi_\mp [\Pi_\pm (X+\zeta), \Pi_\pm (Y+\zeta)]_C = 0$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}$: $T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	$\tilde{J}$ s.t. $\tilde{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\tilde{J})$	$\Pi_\pm = (1_{2d} \pm i\mathcal{J})$
Integrability	$\pi_\mp [\pi_\pm X, \pi_\pm Y] = 0$	$\Pi_\mp [\Pi_\pm (X+\zeta), \Pi_\pm (Y+\zeta)]_C = 0$

$$= \begin{pmatrix} \tilde{J} & P \\ L & K \end{pmatrix}$$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	$\tilde{J}$ s.t. $\tilde{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\tilde{J})$	$\Pi_\pm = (1_{2d} \pm i\mathcal{J})$
Integrability	$\pi_\mp [\pi_\pm X, \pi_\pm Y] = 0$	$\Pi_\mp [\Pi_\pm (X+\zeta), \Pi_\pm (Y+\zeta)]_C = 0$

$$[X+\zeta, Y+\eta]_C = [X,Y] + \mathcal{L}_X \eta - \mathcal{L}_Y \zeta - \tfrac{1}{2} d(i_X \eta - i_Y \zeta)$$

$$= \begin{pmatrix} \tilde{J} & P \\ L & K \end{pmatrix}$$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	$\tilde{J}$ s.t. $\tilde{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\tilde{J})$	$\Pi_\pm = (1_{2d} \pm i\mathcal{J})$
Integrability	$\pi_\mp [\pi_\pm X, \pi_\pm Y] = 0$	$\Pi_\mp [\Pi_\pm (X+\zeta), \Pi_\pm (Y+\zeta)]_C = 0$

$$[X+\zeta, Y+\eta]_C = [X,Y] + \mathcal{L}_X \eta - \mathcal{L}_Y \zeta - \tfrac{1}{2} d(i_X \eta - i_Y \zeta)$$

$$= \begin{pmatrix} \tilde{J} & P \\ L & K \end{pmatrix}$$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	$\tilde{J}$ s.t. $\tilde{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\tilde{J})$	$\Pi_\pm = (1_{2d} \pm i\mathcal{J})$
Integrability	$\pi_\mp [\pi_\pm X, \pi_\pm Y] = 0$	$\Pi_\mp [\Pi_\pm (X+\zeta), \Pi_\pm (Y+\zeta)]_C = 0$

$$[X+\zeta, Y+\eta]_C = [X,Y] + \mathcal{L}_X \eta - \mathcal{L}_Y \zeta - \tfrac{1}{2} d(i_X \eta - i_Y \zeta)$$

$$= \begin{pmatrix} \tilde{J} & P \\ L & K \end{pmatrix}$$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	$\tilde{J}$ s.t. $\tilde{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\tilde{J})$	$\Pi_\pm = (1_{2d} \pm i\mathcal{J})$
Integrability	$\pi_\mp [\pi_\pm X, \pi_\pm Y] = 0$	$\Pi_\mp [\Pi_\pm (X+\zeta), \Pi_\pm (Y+\zeta)]_C = 0$

$$[X+\zeta, Y+\eta]_C = [X,Y] + \mathcal{L}_X \eta - \mathcal{L}_Y \zeta - \tfrac{1}{2} d(i_X \eta - i_Y \zeta)$$

$$= \begin{pmatrix} \tilde{J} & P \\ L & K \end{pmatrix}$$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	$\tilde{J}$ s.t. $\tilde{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\tilde{J})$	$\Pi_\pm = (1_{2d} \pm i\mathcal{J})$
Integrability	$\pi_\mp [\pi_\pm X, \pi_\pm Y] = 0$	$\Pi_\mp [\Pi_\pm (X+\zeta), \Pi_\pm (Y+\zeta)]_C = 0$

$$[X+\zeta, Y+\eta]_C = [X,Y] + \mathcal{L}_X \eta - \mathcal{L}_Y \zeta - \tfrac{1}{2} d(i_X \eta - i_Y \zeta)$$

$$= \begin{pmatrix} \tilde{J} & P \\ L & K \end{pmatrix}$$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	$\tilde{J}$ s.t. $\tilde{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\tilde{J})$	$\Pi_\pm = (1_{2d} \pm i\mathcal{J})$
Integrability	$\pi_\mp [\pi_\pm X, \pi_\pm Y] = 0$	$\Pi_\mp [\Pi_\pm (X+\zeta), \Pi_\pm (Y+\zeta)]_C = 0$

$$[X+\zeta, Y+\eta]_C = [X,Y] + \mathcal{L}_X \eta - \mathcal{L}_Y \zeta - \tfrac{1}{2} d(i_X \eta - i_Y \zeta)$$

$$= \begin{pmatrix} \tilde{J} & P \\ L & K \end{pmatrix}$$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	$\mathcal{J}$ s.t. $\tilde{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\tilde{J})$	$\Pi_\pm = (1_{2d} \pm i\mathcal{J})$
Integrability	$\pi_\mp [\pi_\pm X, \pi_\pm Y] = 0$	$\Pi_\mp [\Pi_\pm (X+\zeta), \Pi_\pm (Y+\zeta)]_C = 0$

$$[X+\zeta, Y+\eta]_C = [X,Y] + \mathcal{L}_X \eta - \mathcal{L}_Y \zeta - \tfrac{1}{2} d(i_X \eta - i_Y \zeta)$$

$$= \begin{pmatrix} \tilde{J} & P \\ L & K \end{pmatrix}$$

$\tilde{J}: T\mathcal{M} \to T\mathcal{M}$	$J^m{}_n$
$P: T^*\mathcal{M} \to T\mathcal{M}$	P^{mn}
$L: T\mathcal{M} \to T^*\mathcal{M}$	L_{mn}
$K: T^*\mathcal{M} \to T^*\mathcal{M}$	$K_m{}^n$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	$\mathcal{J}$ s.t. $\tilde{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\tilde{J})$	$\Pi_\pm = (1_{2d} \pm i\mathcal{J})$
Integrability	$\pi_\mp [\pi_\pm X, \pi_\pm Y] = 0$	$\Pi_\mp [\Pi_\pm (X+\zeta), \Pi_\pm (Y+\zeta)]_C = 0$

$$[X+\zeta, Y+\eta]_C = [X,Y] + \mathcal{L}_X \eta - \mathcal{L}_Y \zeta - \tfrac{1}{2} d(i_X \eta - i_Y \zeta)$$

$$= \begin{pmatrix} \tilde{J} & P \\ L & K \end{pmatrix}$$

$\tilde{J}: T\mathcal{M} \to T\mathcal{M}$	$J^m{}_n$
$P: T^*\mathcal{M} \to T\mathcal{M}$	P^{mn}
$L: T\mathcal{M} \to T^*\mathcal{M}$	L_{mn}
$K: T^*\mathcal{M} \to T^*\mathcal{M}$	$K_m{}^n$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	$\tilde{J}$ s.t. $\tilde{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\tilde{J})$	$\Pi_\pm = (1_{2d} \pm i\mathcal{J})$
Integrability	$\pi_\mp [\pi_\pm X, \pi_\pm Y] = 0$	$\Pi_\mp [\Pi_\pm (X+\zeta), \Pi_\pm (Y+\zeta)]_C = 0$

$$[X+\zeta, Y+\eta]_C = [X,Y] + \mathcal{L}_X \eta - \mathcal{L}_Y \zeta - \tfrac{1}{2} d(i_X \eta - i_Y \zeta)$$

$$= \begin{pmatrix} \tilde{J} & P \\ L & K \end{pmatrix}$$

$\tilde{J}: T\mathcal{M} \to T\mathcal{M}$	$J^m{}_n$
$P: T^*\mathcal{M} \to T\mathcal{M}$	P^{mn}
$L: T\mathcal{M} \to T^*\mathcal{M}$	L_{mn}
$K: T^*\mathcal{M} \to T^*\mathcal{M}$	$K_m{}^n$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	$\mathcal{J}$ s.t. $\tilde{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\tilde{J})$	$\Pi_\pm = (1_{2d} \pm i\mathcal{J})$
Integrability	$\pi_\mp [\pi_\pm X, \pi_\pm Y] = 0$	$\Pi_\mp [\Pi_\pm (X+\zeta), \Pi_\pm (Y+\zeta)]_C = 0$

$$[X+\zeta, Y+\eta]_C = [X,Y] + \mathcal{L}_X \eta - \mathcal{L}_Y \zeta - \tfrac{1}{2} d(i_X \eta - i_Y \zeta)$$

$$= \begin{pmatrix} \tilde{J} & P \\ L & K \end{pmatrix}$$

$\tilde{J}: T\mathcal{M} \to T\mathcal{M}$	$J^m{}_n$
$P: T^*\mathcal{M} \to T\mathcal{M}$	P^{mn}
$L: T\mathcal{M} \to T^*\mathcal{M}$	L_{mn}
$K: T^*\mathcal{M} \to T^*\mathcal{M}$	$K_m{}^n$

Demanding $\mathcal{J}^2 = -1_{2d}$, $\mathcal{J}^t I \mathcal{J} = I$

eneralized complex geometry

Hitchin
Gualtieri

Differential geometry on $T \oplus T^*$ sections are $X+\zeta$

On $T \oplus T^*$ define Generalized Almost Complex Structure (GACS) $\mathcal{J}: T \oplus T^* \to T \oplus T^*$

$$\mathcal{J}^2 = -1_{2d}$$
$$\mathcal{J}^t I \mathcal{J} = I$$

	T	$T \oplus T^*$
GACS	$\tilde{J}$ s.t. $\tilde{J}^2 = -1_d$	$\mathcal{J}$ s.t. $\mathcal{J}^2 = -1_{2d}$
Projectors	$\pi_\pm = (1_d \pm i\tilde{J})$	$\Pi_\pm = (1_{2d} \pm i\mathcal{J})$
Integrability	$\pi_\mp [\pi_\pm X, \pi_\pm Y] = 0$	$\Pi_\mp [\Pi_\pm (X+\zeta), \Pi_\pm (Y+\zeta)]_C = 0$

$$[X+\zeta, Y+\eta]_C = [X,Y] + \mathcal{L}_X \eta - \mathcal{L}_Y \zeta - \tfrac{1}{2} d(i_X \eta - i_Y \zeta)$$

$$= \begin{pmatrix} \tilde{J} & P \\ L & K \end{pmatrix}$$

$\tilde{J}: T\mathcal{M} \to T\mathcal{M}$	$J^m{}_n$
$P: T^*\mathcal{M} \to T\mathcal{M}$	P^{mn}
$L: T\mathcal{M} \to T^*\mathcal{M}$	L_{mn}
$K: T^*\mathcal{M} \to T^*\mathcal{M}$	$K_m{}^n$

Demanding $\mathcal{J}^2 = -1_{2d}$, $\mathcal{J}^t I \mathcal{J} = I$

$$\rightarrow \quad \mathcal{J} = \begin{pmatrix} \tilde{J} & P \\ L & -\tilde{J}^t \end{pmatrix}$$

Get conditions

$$K = -\tilde{J}^t$$
$$P^t = -P$$
$$L^t = -L$$

A GACS has the form

$$\mathcal{J} = \begin{pmatrix} \tilde{J} & P \\ L & -\tilde{J}^t \end{pmatrix}$$

A GACS has the form

$$\mathcal{J} = \begin{pmatrix} \tilde{J} & P \\ L & -\tilde{J}^t \end{pmatrix}$$

An ACS $\subset$ GACS. Consider :

A GACS has the form

$$\mathcal{J} = \begin{pmatrix} \tilde{J} & P \\ L & -\tilde{J}^t \end{pmatrix}$$

An ACS $\subset$ GACS. Consider :

$$_1 = \begin{pmatrix} \tilde{J} & 0 \\ 0 & -\tilde{J}^t \end{pmatrix}$$

A GACS has the form

$$\mathcal{J} = \begin{pmatrix} \tilde{J} & P \\ L & -\tilde{J}^t \end{pmatrix}$$

An ACS $\subset$ GACS. Consider :

$$\mathcal{J}_1 = \begin{pmatrix} \tilde{J} & 0 \\ 0 & -\tilde{J}^t \end{pmatrix}$$ Integrability of GACS $\mathcal{J}_1 \Rightarrow$ $\tilde{J}$ is integrable (it is a CS in T) $\Rightarrow \mathcal{M}$ is complex

A GACS has the form

$$\mathcal{J} = \begin{pmatrix} \tilde{J} & P \\ L & -\tilde{J}^t \end{pmatrix}$$

An ACS $\subset$ GACS. Consider :

$$_1 = \begin{pmatrix} \tilde{J} & 0 \\ 0 & -\tilde{J}^t \end{pmatrix}$$ Integrability of GACS $\mathcal{J}_1 \Rightarrow$ $\tilde{J}$ is integrable (it is a CS in T) $\Rightarrow \mathcal{M}$ is complex

But GACS have more...

onsider $\mathcal{J}_2 = \begin{pmatrix} 0 & -J^{-1} \\ J & 0 \end{pmatrix}$

A GACS has the form

$$\mathcal{J} = \begin{pmatrix} \tilde{J} & P \\ L & -\tilde{J}^t \end{pmatrix}$$

An ACS $\subset$ GACS. Consider :

$$\mathcal{J}_1 = \begin{pmatrix} \tilde{J} & 0 \\ 0 & -\tilde{J}^t \end{pmatrix}$$ Integrability of GACS $\mathcal{J}_1 \Rightarrow$ $\tilde{J}$ is integrable (it is a CS in T) $\Rightarrow \mathcal{M}$ is complex

But GACS have more...

Consider $\mathcal{J}_2 = \begin{pmatrix} 0 & -J^{-1} \\ J & 0 \end{pmatrix}$

A GACS has the form

$$\mathcal{J} = \begin{pmatrix} \tilde{J} & P \\ L & -\tilde{J}^t \end{pmatrix}$$

An ACS $\subset$ GACS. Consider :

$\mathcal{J}_1 = \begin{pmatrix} \tilde{J} & 0 \\ 0 & -\tilde{J}^t \end{pmatrix}$ Integrability of GACS $\mathcal{J}_1 \Rightarrow$ $\tilde{J}$ is integrable (it is a CS in T) $\Rightarrow$ $\mathcal{M}$ is complex

But GACS have more...

Consider $\mathcal{J}_2 = \begin{pmatrix} 0 & -J^{-1} \\ J & 0 \end{pmatrix}$ Integrability of $\mathcal{J}_2 \Rightarrow$ dJ=0. If J is non-degenerate $\Rightarrow$ $\mathcal{M}$ is symplectic

A GACS has the form

$$\mathcal{J} = \begin{pmatrix} \tilde{J} & P \\ L & -\tilde{J}^t \end{pmatrix}$$

An ACS $\subset$ GACS. Consider :

$$\mathcal{J}_1 = \begin{pmatrix} \tilde{J} & 0 \\ 0 & -\tilde{J}^t \end{pmatrix}$$ Integrability of GACS $\mathcal{J}_1 \Rightarrow$ $\tilde{J}$ is integrable (it is a CS in T) $\Rightarrow$ $\mathcal{M}$ is complex

But GACS have more...

Consider $\mathcal{J}_2 = \begin{pmatrix} 0 & -J^{-1} \\ J & 0 \end{pmatrix}$ Integrability of $\mathcal{J}_2 \Rightarrow$ dJ=0. If J is non-degenerate $\Rightarrow$ $\mathcal{M}$ is symplectic

Complex manifolds
Symplectic manifolds
→ admit GCS

A GACS has the form

$$\mathcal{J} = \begin{pmatrix} \tilde{J} & P \\ L & -\tilde{J}^t \end{pmatrix}$$

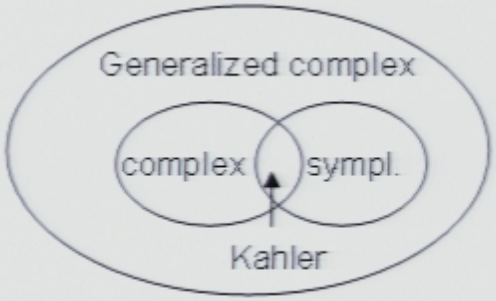
An ACS $\subset$ GACS. Consider :

$$_1 = \begin{pmatrix} \tilde{J} & 0 \\ 0 & -\tilde{J}^t \end{pmatrix}$$ Integrability of GACS $\mathcal{J}_1 \Rightarrow$ $\tilde{J}$ is integrable (it is a CS in T) $\Rightarrow$ $\mathcal{M}$ is complex

But GACS have more...

onsider $\mathcal{J}_2 = \begin{pmatrix} 0 & -J^{-1} \\ J & 0 \end{pmatrix}$ Integrability of $\mathcal{J}_2 \Rightarrow$ dJ=0. If J is non-degenerate $\Rightarrow$ $\mathcal{M}$ is symplectic

Complex manifolds
Symplectic manifolds
→ admit GCS



A GACS has the form

$$\mathcal{J} = \begin{pmatrix} \tilde{J} & P \\ L & -\tilde{J}^t \end{pmatrix}$$

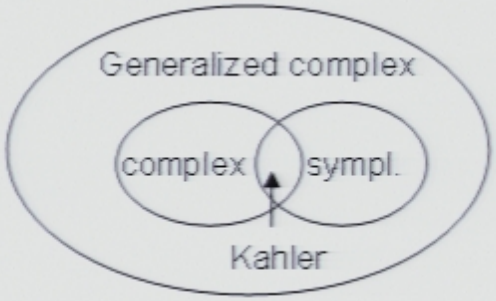
An ACS $\subset$ GACS. Consider :

$$_1 = \begin{pmatrix} \tilde{J} & 0 \\ 0 & -\tilde{J}^t \end{pmatrix}$$ Integrability of GACS $\mathcal{J}_1 \Rightarrow$ $\tilde{J}$ is integrable (it is a CS in T) $\Rightarrow \mathcal{M}$ is complex

But GACS have more...

onsider $\mathcal{J}_2 = \begin{pmatrix} 0 & -J^{-1} \\ J & 0 \end{pmatrix}$ Integrability of $\mathcal{J}_2 \Rightarrow$ dJ=0. If J is non-degenerate $\Rightarrow$ $\mathcal{M}$ is symplectic

Complex manifolds
Symplectic manifolds
→ admit GCS



omplex: locally equivalent to $\mathbb{C}^{d/2}$

A GACS has the form

$$\mathcal{J} = \begin{pmatrix} \tilde{J} & P \\ L & -\tilde{J}^t \end{pmatrix}$$

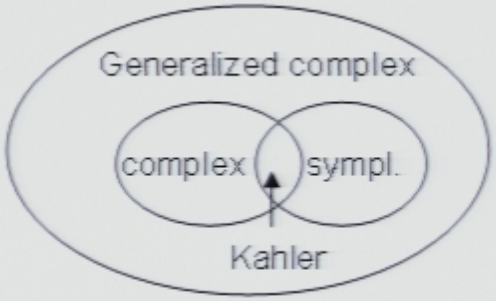
An ACS $\subset$ GACS. Consider :

$$_1 = \begin{pmatrix} \tilde{J} & 0 \\ 0 & -\tilde{J}^t \end{pmatrix}$$ Integrability of GACS $\mathcal{J}_1 \Rightarrow$ $\tilde{J}$ is integrable (it is a CS in T) $\Rightarrow \mathcal{M}$ is complex

But GACS have more...

onsider $\mathcal{J}_2 = \begin{pmatrix} 0 & -J^{-1} \\ J & 0 \end{pmatrix}$ Integrability of $\mathcal{J}_2 \Rightarrow$ dJ=0. If J is non-degenerate $\Rightarrow$ $\mathcal{M}$ is symplectic

Complex manifolds
Symplectic manifolds
→ admit GCS



omplex: locally equivalent to $\mathbb{C}^{d/2}$

ymplectic: locally equivalent to $(\mathbb{R}^d, J)$; $J = dx^1 \wedge dx^2 + \ldots + dx^{d-1} \wedge dx^d$

A GACS has the form

$$\mathcal{J} = \begin{pmatrix} \tilde{J} & P \\ L & -\tilde{J}^t \end{pmatrix}$$

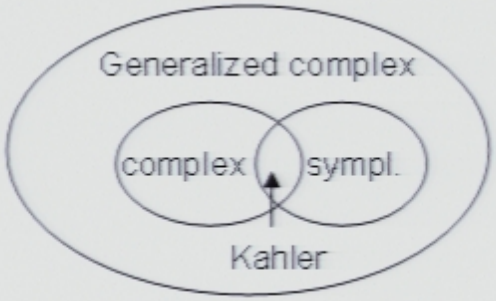
An ACS $\subset$ GACS. Consider :

$$_1 = \begin{pmatrix} \tilde{J} & 0 \\ 0 & -\tilde{J}^t \end{pmatrix}$$ Integrability of GACS $\mathcal{J}_1 \Rightarrow$ $\tilde{J}$ is integrable (it is a CS in T) $\Rightarrow \mathcal{M}$ is complex

But GACS have more...

onsider $\mathcal{J}_2 = \begin{pmatrix} 0 & -J^{-1} \\ J & 0 \end{pmatrix}$ Integrability of $\mathcal{J}_2 \Rightarrow$ dJ=0. If J is non-degenerate $\Rightarrow$ $\mathcal{M}$ is symplectic

Complex manifolds
Symplectic manifolds
→ admit GCS



omplex: locally equivalent to $\mathbb{C}^{d/2}$

ymplectic: locally equivalent to $(\mathbb{R}^d, J)$; $J = dx^1 \wedge dx^2 + \ldots + dx^{d-1} \wedge dx^d$

eneralized complex: locally equivalent to $\mathbb{C}^k \otimes (\mathbb{R}^{d-2k}, J)$ k: rank. k=0 for symplectic

A GACS has the form

$$\mathcal{J} = \begin{pmatrix} \tilde{J} & P \\ L & -\tilde{J}^t \end{pmatrix}$$

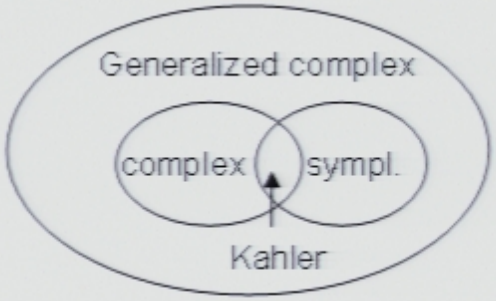
An ACS $\subset$ GACS. Consider :

$$_1 = \begin{pmatrix} \tilde{J} & 0 \\ 0 & -\tilde{J}^t \end{pmatrix}$$ Integrability of GACS $\mathcal{J}_1 \Rightarrow$ $\tilde{J}$ is integrable (it is a CS in T) $\Rightarrow \mathcal{M}$ is complex

But GACS have more...

onsider $\mathcal{J}_2 = \begin{pmatrix} 0 & -J^{-1} \\ J & 0 \end{pmatrix}$ Integrability of $\mathcal{J}_2 \Rightarrow$ dJ=0. If J is non-degenerate $\Rightarrow$ $\mathcal{M}$ is symplectic

Complex manifolds
Symplectic manifolds
→ admit GCS



omplex: locally equivalent to $\mathbb{C}^{d/2}$

ymplectic: locally equivalent to $(\mathbb{R}^d, J)$; $J = dx^1 \wedge dx^2 + \ldots + dx^{d-1} \wedge dx^d$

eneralized complex: locally equivalent to $\mathbb{C}^k \otimes (\mathbb{R}^{d-2k}, J)$ k: rank. k=0 for symplectic

A GACS has the form

$$\mathcal{J} = \begin{pmatrix} \tilde{J} & P \\ L & -\tilde{J}^t \end{pmatrix}$$

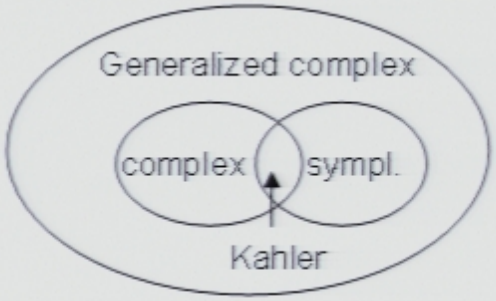
An ACS $\subset$ GACS. Consider :

$$_1 = \begin{pmatrix} \tilde{J} & 0 \\ 0 & -\tilde{J}^t \end{pmatrix}$$ Integrability of GACS $\mathcal{J}_1 \Rightarrow$ $\tilde{J}$ is integrable (it is a CS in T) $\Rightarrow \mathcal{M}$ is complex

But GACS have more...

onsider $\mathcal{J}_2 = \begin{pmatrix} 0 & -J^{-1} \\ J & 0 \end{pmatrix}$ Integrability of $\mathcal{J}_2 \Rightarrow$ dJ=0. If J is non-degenerate $\Rightarrow$ $\mathcal{M}$ is symplectic

Complex manifolds
Symplectic manifolds
→ admit GCS



omplex: locally equivalent to $\mathbb{C}^{d/2}$

ymplectic: locally equivalent to $(\mathbb{R}^d, J)$; $J = dx^1 \wedge dx^2 + \ldots + dx^{d-1} \wedge dx^d$

eneralized complex: locally equivalent to $\mathbb{C}^k \otimes (\mathbb{R}^{d-2k}, J)$ k: rank. k=0 for symplectic

A GACS has the form

$$\mathcal{J} = \begin{pmatrix} \tilde{J} & P \\ L & -\tilde{J}^t \end{pmatrix}$$

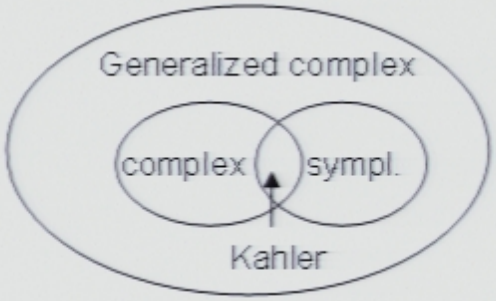
An ACS $\subset$ GACS. Consider :

$$_1 = \begin{pmatrix} \tilde{J} & 0 \\ 0 & -\tilde{J}^t \end{pmatrix}$$ Integrability of GACS $\mathcal{J}_1 \Rightarrow$ $\tilde{J}$ is integrable (it is a CS in T) $\Rightarrow \mathcal{M}$ is complex

But GACS have more...

onsider $\mathcal{J}_2 = \begin{pmatrix} 0 & -J^{-1} \\ J & 0 \end{pmatrix}$ Integrability of $\mathcal{J}_2 \Rightarrow$ dJ=0. If J is non-degenerate $\Rightarrow$ $\mathcal{M}$ is symplectic

Complex manifolds
Symplectic manifolds
→ admit GCS



omplex: locally equivalent to $\mathbb{C}^{d/2}$

ymplectic: locally equivalent to $(\mathbb{R}^d, J)$; $J = dx^1 \wedge dx^2 + \ldots + dx^{d-1} \wedge dx^d$

eneralized complex: locally equivalent to $\mathbb{C}^k \otimes (\mathbb{R}^{d-2k}, J)$ k: rank. k=0 for symplectic

A GACS has the form

$$\mathcal{J} = \begin{pmatrix} \tilde{J} & P \\ L & -\tilde{J}^t \end{pmatrix}$$

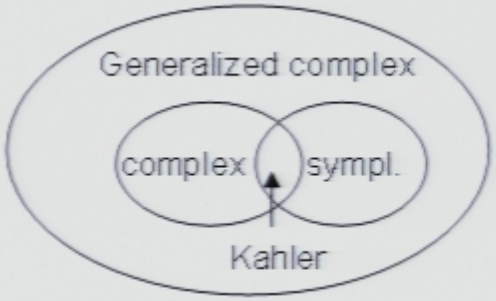
An ACS $\subset$ GACS. Consider :

$$_1 = \begin{pmatrix} \tilde{J} & 0 \\ 0 & -\tilde{J}^t \end{pmatrix}$$ Integrability of GACS $\mathcal{J}_1 \Rightarrow$ $\tilde{J}$ is integrable (it is a CS in T) $\Rightarrow \mathcal{M}$ is complex

But GACS have more...

onsider $\mathcal{J}_2 = \begin{pmatrix} 0 & -J^{-1} \\ J & 0 \end{pmatrix}$ Integrability of $\mathcal{J}_2 \Rightarrow$ dJ=0. If J is non-degenerate $\Rightarrow$ $\mathcal{M}$ is symplectic

Complex manifolds
Symplectic manifolds
→ admit GCS



omplex: locally equivalent to $\mathbb{C}^{d/2}$

ymplectic: locally equivalent to $(\mathbb{R}^d, J)$; $J = dx^1 \wedge dx^2 + \ldots + dx^{d-1} \wedge dx^d$

eneralized complex: locally equivalent to $\mathbb{C}^k \otimes (\mathbb{R}^{d-2k}, J)$ k: rank. k=0 for symplectic

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6)

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0, \{\gamma^m,\gamma_n\}=\delta^m{}_n$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m, \gamma^n\}=\{\gamma_m, \gamma_n\}=0, \{\gamma^m, \gamma_n\}= \delta^m{}_n$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6	Clifford (6,6)
	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms		

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m, \gamma^n\}=\{\gamma_m, \gamma_n\}=0, \{\gamma^m, \gamma_n\}= \delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}= g^{\bar{i}j}\, \iota_{\partial_j}$	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m, \gamma^n\}=\{\gamma_m, \gamma_n\}=0, \{\gamma^m, \gamma_n\}= \delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}= g^{\bar{i}j}\, \iota_{\partial_j}$	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m, \gamma^n\}=\{\gamma_m, \gamma_n\}=0, \{\gamma^m, \gamma_n\}= \delta^m{}_n$
Representation in terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}= g^{\bar{i}j}\, \iota_{\partial_j}$	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation in terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation in terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0, \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor		

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor		

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m, \gamma^n\}=\{\gamma_m, \gamma_n\}=0, \{\gamma^m, \gamma_n\}= \delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}= g^{\bar{i}j}\, \iota_{\partial j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m = \iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor		

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0, \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0, \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation in terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	
	Spinors $\leftrightarrow$ (p,0) forms	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0)
	Spinors $\leftrightarrow$ (p,0) forms	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0) Spinors $\leftrightarrow$ (p,0) forms	Ω : (3,0) $\quad$ Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0)

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0, \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0)
	Spinors $\leftrightarrow$ (p,0) forms	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0)
	Spinors $\leftrightarrow$ (p,0) forms	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0)
	Spinors $\leftrightarrow$ (p,0) forms	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0) Spinors $\leftrightarrow$ (p,0) forms	Ω : (3,0) $\quad$ Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0)

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$	
	Clifford 6	Clifford (6,6)	
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$	
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$	
Clifford vacuum	Ω	Ω	
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$	
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)	Ω : (3,0) $\gamma_i\Omega$: (2,0) $\gamma_{ij}\,\Omega$: (1,0) $\gamma_{ijk}\,\Omega$: (0,0)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms	

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m, \gamma^n\}=\{\gamma_m, \gamma_n\}=0, \{\gamma^m, \gamma_n\}= \delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}= g^{\bar{i}j}\, \iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m = \iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\, \Omega =0$	$\gamma^i\, \Omega=\gamma_{\bar{i}}\, \Omega =0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\, \Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\, \Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\, \Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\, \Omega : (3,1)$ $\quad$ $\gamma_i \Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\, \Omega : (3,2)$ $\quad$ $\gamma_{ij}\, \Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\, \Omega : (3,3)$ $\quad$ $\gamma_{ijk}\, \Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_{\bar{i}}\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation in terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\gamma_{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\, J_{mn}\,\gamma^n)\, e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\, T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

S

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Ω ↑ S

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Ω ↑ S $\quad$ e^{iJ} ↑ S^+

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{i\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{i\bar{j}k}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Ω ↑ S $\quad$ e^{iJ} ↑ S^+

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0$, $\{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3) $\gamma_i\Omega$: (2,0) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ},e^{-iJ}>\neq 0$ $\quad$ (Ω ↑ S, e^{iJ} ↑ S^+)

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0$, $\{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega:(3,0)$ $\gamma^{\bar{i}}\,\Omega:(2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega:(1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega:(0,0)$	$\Omega:(3,0)$ $\quad$ $\Omega:(3,0)$ $\gamma^{\bar{i}}\,\Omega:(3,1)$ $\quad$ $\gamma_i\Omega:(2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega:(3,2)$ $\quad$ $\gamma_{ij}\,\Omega:(1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega:(3,3)$ $\quad$ $\gamma_{ijk}\,\Omega:(0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ},e^{-iJ}>\neq 0$ $\quad$ $\Omega\in S$, $e^{iJ}\in S^+$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega:(3,0)$ $\gamma^{\bar{i}}\,\Omega:(2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega:(1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega:(0,0)$	$\Omega:(3,0)$ $\quad$ $\Omega:(3,0)$ $\gamma^{\bar{i}}\,\Omega:(3,1)$ $\quad$ $\gamma_i\Omega:(2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega:(3,2)$ $\quad$ $\gamma_{ij}\,\Omega:(1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega:(3,3)$ $\quad$ $\gamma_{ijk}\,\Omega:(0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $\quad <\Omega,\overline{\Omega}>\neq 0$ $\quad$ and $\quad <e^{iJ},e^{-iJ}>\neq 0$

$\Omega \in S \qquad e^{iJ}\in S^+$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $\quad <\Omega, \overline{\Omega}> \neq 0 \quad$ and $\quad <e^{iJ}, e^{-iJ}> \neq 0$ $\qquad$ $\Omega \in S$, $e^{iJ} \in S^+$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0$, $\{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ}\,,\,e^{-iJ}>\neq 0$ $\quad$ (Ω ∈ S^-, e^{iJ} ∈ S^+)

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0$, $\{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega:(3,0)$ $\gamma^{\bar{i}}\,\Omega:(2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega:(1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega:(0,0)$	$\Omega:(3,0)$ $\quad$ $\Omega:(3,0)$ $\gamma^{\bar{i}}\,\Omega:(3,1)$ $\quad$ $\gamma_i\Omega:(2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega:(3,2)$ $\quad$ $\gamma_{ij}\,\Omega:(1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega:(3,3)$ $\quad$ $\gamma_{ijk}\,\Omega:(0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ},e^{-iJ}>\neq 0$ $\quad$ (Ω: S, e^{iJ}: S^+)

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $\quad <\Omega, \overline{\Omega}> \neq 0 \quad$ and $\quad <e^{iJ}, e^{-iJ}> \neq 0$

$\Omega \in S \qquad e^{iJ} \in S^+$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $\quad <\Omega, \overline{\Omega}> \neq 0 \quad$ and $\quad <e^{iJ}, e^{-iJ}> \neq 0$

$\Omega \in S \qquad e^{iJ} \in S^+$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $\quad <\Omega, \overline{\Omega}> \neq 0 \quad$ and $\quad <e^{iJ}, e^{-iJ}> \neq 0$

$\Omega \in S \qquad e^{iJ} \in S^+$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0$, $\{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ},e^{-iJ}>\neq 0$ $\quad$ (Ω: S, e^{iJ}: S^+)

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $\quad <\Omega, \overline{\Omega}> \neq 0 \quad$ and $\quad <e^{iJ}, e^{-iJ}> \neq 0$

$\Omega \in S \qquad e^{iJ} \in S^+$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0$, $\{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega:(3,0)$ $\gamma^{\bar{i}}\,\Omega:(2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega:(1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega:(0,0)$	$\Omega:(3,0)$ $\quad$ $\Omega:(3,0)$ $\gamma^{\bar{i}}\,\Omega:(3,1)$ $\quad$ $\gamma_i\Omega:(2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega:(3,2)$ $\quad$ $\gamma_{ij}\,\Omega:(1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega:(3,3)$ $\quad$ $\gamma_{ijk}\,\Omega:(0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ},e^{-iJ}>\neq 0$ $\quad$ (Ω: S, e^{iJ}: S^+)

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $\quad <\Omega, \overline{\Omega}> \neq 0 \quad$ and $\quad <e^{iJ}, e^{-iJ}> \neq 0$

$\Omega \in S \qquad e^{iJ} \in S^+$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0$, $\{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➡ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ},e^{-iJ}>\neq 0$ $\quad$ Ω ∈ S, e^{iJ} ∈ S^+

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0$, $\{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $\quad <\Omega, \overline{\Omega}> \neq 0 \quad$ and $\quad <e^{iJ}, e^{-iJ}> \neq 0$

$\Omega \in S \qquad e^{iJ} \in S^+$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0$, $\{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ}\,,\,e^{-iJ}>\neq 0$ $\quad$ Ω ∈ S, e^{iJ} ∈ S^+

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $\quad <\Omega, \overline{\Omega}> \neq 0 \quad$ and $\quad <e^{iJ}, e^{-iJ}> \neq 0$

$\Omega \in S \qquad e^{iJ} \in S^+$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➡ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $\quad <\Omega, \overline{\Omega}> \neq 0 \quad$ and $\quad <e^{iJ}, e^{-iJ}> \neq 0$

Ω ↑ S $\quad$ e^{iJ} ↑ S^+

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0$, $\{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➡ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ}\,,\,e^{-iJ}>\neq 0$ $\quad$ $\Omega \in S$, $e^{iJ} \in S^+$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0$, $\{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ}\,,\,e^{-iJ}>\neq 0$ $\quad$ (Ω : S, e^{iJ} : S^+)

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

On a manifold with SU(3) structure in T ➡ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ},e^{-iJ}>\neq 0$ $\quad$ (Ω ∈ S, e^{iJ} ∈ S^+)

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

- On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.
  $\Omega \in S \qquad e^{iJ} \in S^+$
- Such that $< \Omega, \overline{\Omega} > \neq 0$ and $< e^{iJ}, e^{-iJ} > \neq 0$
- 1-1 correspondence between pure spinors ϕ with $< \phi, \overline{\phi} > \neq 0$ and GACS $\mathcal{J}$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

- On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.
  $\Omega \in S \qquad e^{iJ} \in S^+$
- Such that $< \Omega, \overline{\Omega} > \neq 0$ and $< e^{iJ}, e^{-iJ} > \neq 0$
- 1-1 correspondence between pure spinors ϕ with $< \phi, \overline{\phi} > \neq 0$ and GACS $\mathcal{J}$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0$, $\{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_i\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

- On a manifold with SU(3) structure in T ➡ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$. (Ω : S, e^{iJ} : S^+)
- Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ},e^{-iJ}>\neq 0$
- 1-1 correspondence between pure spinors ϕ with $<\phi,\overline{\phi}>\neq 0$ and GACS $\mathcal{J}$

  Anihilator of $\phi \leftrightarrow$ L: +i eigenbundle of $\mathcal{J}$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$ Spinors $\leftrightarrow$ (p,0) forms	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$ Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

- On a manifold with SU(3) structure in T ➡ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.
  $\Omega \in S$, $e^{iJ} \in S^+$
- Such that $< \Omega, \overline{\Omega} > \neq 0$ and $< e^{iJ}, e^{-iJ} > \neq 0$
- 1-1 correspondence between pure spinors ϕ with $< \phi, \overline{\phi} > \neq 0$ and GACS $\mathcal{J}$

  Anihilator of $\phi \leftrightarrow$ L: +i eigenbundle of $\mathcal{J}$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad \Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad \gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad \gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad \gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\, J_{mn}\,\gamma^n)\, e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\, T^*$

On a manifold with SU(3) structure in T ➡ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.

Ω : S $\quad e^{iJ}$: S^+

Such that $< \Omega, \overline{\Omega} > \neq 0$ and $< e^{iJ}, e^{-iJ} > \neq 0$

1-1 correspondence between pure spinors ϕ with $< \phi, \overline{\phi} > \neq 0$ and GACS $\mathcal{J}$

Anihilator of $\phi \leftrightarrow$ L: +i eigenbundle of $\mathcal{J}$

maximally isotropic subspaces

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

- On a manifold with SU(3) structure in T ➡ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.
  (Ω: S, e^{iJ}: S^+)
- Such that $< \Omega, \overline{\Omega} > \neq 0$ and $< e^{iJ}, e^{-iJ} > \neq 0$
- 1-1 correspondence between pure spinors ϕ with $< \phi, \overline{\phi} > \neq 0$ and GACS $\mathcal{J}$

Anihilator of $\phi \leftrightarrow$ L: +i eigenbundle of $\mathcal{J}$

maximally isotropic subspaces

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\,\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\,\Omega : (3,1)$ $\quad$ $\gamma_i\Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega : (3,2)$ $\quad$ $\gamma_{ij}\,\Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega : (3,3)$ $\quad$ $\gamma_{ijk}\,\Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\,T^*$

- On a manifold with SU(3) structure in T ➡ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.
  $\Omega \in S \qquad e^{iJ} \in S^+$
- Such that $< \Omega, \overline{\Omega} > \neq 0$ and $< e^{iJ}, e^{-iJ} > \neq 0$
- 1-1 correspondence between pure spinors ϕ with $< \phi, \overline{\phi} > \neq 0$ and GACS $\mathcal{J}$

Anihilator of $\phi \leftrightarrow$ L: +i eigenbundle of $\mathcal{J}$

maximally isotropic subspaces

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m, \gamma^n\}=\{\gamma_m, \gamma_n\}=0, \{\gamma^m, \gamma_n\}= \delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}= g^{\bar{i}j}\, \iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m = \iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\, \Omega =0$	$\gamma^i\, \Omega=\gamma_{\bar{i}}\, \Omega =0$
Basis	$\Omega : (3,0)$ $\gamma^{\bar{i}}\, \Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\, \Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\, \Omega : (0,0)$	$\Omega : (3,0)$ $\quad$ $\Omega : (3,0)$ $\gamma^{\bar{i}}\, \Omega : (3,1)$ $\quad$ $\gamma_i \Omega : (2,0)$ $\gamma^{\bar{i}\bar{j}}\, \Omega : (3,2)$ $\quad$ $\gamma_{ij}\, \Omega : (1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\, \Omega : (3,3)$ $\quad$ $\gamma_{ijk}\, \Omega : (0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ} = 1 + iJ - \frac{1}{2}J^2 - i\frac{1}{3!}J^3$$

$$(\gamma_m + i\, J_{mn}\, \gamma^n)\, e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm} = \Lambda^{ev,odd}\, T^*$

- On a manifold with SU(3) structure in T ➡ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.
  (Ω: S, e^{iJ}: S^+)
- Such that $< \Omega, \overline{\Omega} > \neq 0$ and $< e^{iJ}, e^{-iJ} > \neq 0$
- 1-1 correspondence between pure spinors ϕ with $< \phi, \overline{\phi} > \neq 0$ and GACS $\mathcal{J}$

Anihilator of $\phi \leftrightarrow$ L: +i eigenbundle of $\mathcal{J}$

maximally isotropic subspaces

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0$, $\{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

- On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$. (Ω: S, e^{iJ}: S^+)
- Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ},e^{-iJ}>\neq 0$
- 1-1 correspondence between pure spinors ϕ with $<\phi,\overline{\phi}>\neq 0$ and GACS $\mathcal{J}$

Anihilator of ϕ $\leftrightarrow$ L: +i eigenbundle of $\mathcal{J}$ $\qquad <\phi,\overline{\phi}>\neq 0 \Leftrightarrow L\cap\overline{L}=0$

maximally isotropic subspaces

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0$, $\{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

- On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$. (Ω: S, e^{iJ}: S^+)
- Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ},e^{-iJ}>\neq 0$
- 1-1 correspondence between pure spinors ϕ with $<\phi,\overline{\phi}>\neq 0$ and GACS $\mathcal{J}$

  Anihilator of $\phi \leftrightarrow$ L: +i eigenbundle of $\mathcal{J}$ $\quad <\phi,\overline{\phi}>\neq 0 \Leftrightarrow L\cap\overline{L}=0$
- Integrability of $\mathcal{J} \Leftrightarrow \exists$ v and ξ s.t $d\varphi=(\iota_v+\xi\wedge)\varphi$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0$, $\{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_i\,\Omega=0$
Basis	$\Omega:(3,0)$ $\gamma^{\bar{i}}\,\Omega:(2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega:(1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega:(0,0)$	$\Omega:(3,0)$ $\quad$ $\Omega:(3,0)$ $\gamma^{\bar{i}}\,\Omega:(3,1)$ $\quad$ $\gamma_i\Omega:(2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega:(3,2)$ $\quad$ $\gamma_{ij}\,\Omega:(1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega:(3,3)$ $\quad$ $\gamma_{ijk}\,\Omega:(0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

- On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.
  $\Omega \in S$, $e^{iJ} \in S^+$
- Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ},e^{-iJ}>\neq 0$
- 1-1 correspondence between pure spinors ϕ with $<\phi,\overline{\phi}>\neq 0$ and GACS $\mathcal{J}$

  Anihilator of $\phi \leftrightarrow$ L: +i eigenbundle of $\mathcal{J}$ $\quad <\phi,\overline{\phi}>\neq 0 \Leftrightarrow L\cap\overline{L}=0$
- Integrability of $\mathcal{J} \Leftrightarrow \exists$ v and ξ s.t $d\varphi=(\iota_v+\xi\wedge)\varphi$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0$, $\{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	$\Omega:(3,0)$ $\gamma^{\bar{i}}\,\Omega:(2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega:(1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega:(0,0)$	$\Omega:(3,0)$ $\quad$ $\Omega:(3,0)$ $\gamma^{\bar{i}}\,\Omega:(3,1)$ $\quad$ $\gamma_i\Omega:(2,0)$ $\gamma^{\bar{i}\bar{j}}\,\Omega:(3,2)$ $\quad$ $\gamma_{ij}\,\Omega:(1,0)$ $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega:(3,3)$ $\quad$ $\gamma_{ijk}\,\Omega:(0,0)$
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

- On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$. (Ω: S, e^{iJ}: S^+)
- Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ},e^{-iJ}>\neq 0$
- 1-1 correspondence between pure spinors ϕ with $<\phi,\overline{\phi}>\neq 0$ and GACS $\mathcal{J}$

  Anihilator of $\phi \leftrightarrow$ L: +i eigenbundle of $\mathcal{J}$ $\quad <\phi,\overline{\phi}>\neq 0 \Leftrightarrow L\cap\overline{L}=0$
- Integrability of $\mathcal{J} \Leftrightarrow \exists$ v and ξ s.t $d\varphi=(\iota_v+\xi\wedge)\varphi$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0$, $\{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3) $\gamma_i\Omega$: (2,0) $\gamma_{ij}\,\Omega$: (1,0) $\gamma_{ijk}\,\Omega$: (0,0)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

- On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$. (Ω: S, e^{iJ}: S^+)
- Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ},e^{-iJ}>\neq 0$
- 1-1 correspondence between pure spinors ϕ with $<\phi,\overline{\phi}>\neq 0$ and GACS $\mathcal{J}$

  Anihilator of $\phi \leftrightarrow$ L: +i eigenbundle of $\mathcal{J}$ $\qquad <\phi,\overline{\phi}>\neq 0 \Leftrightarrow L\cap\overline{L}=0$
- Integrability of $\mathcal{J} \Leftrightarrow \exists$ v and ξ s.t $d\varphi=(\iota_v+\xi\wedge)\varphi$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0$, $\{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

- On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.
  $\Omega \in S \quad e^{iJ} \in S^+$
- Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ},e^{-iJ}>\neq 0$
- 1-1 correspondence between pure spinors ϕ with $<\phi,\overline{\phi}>\neq 0$ and GACS $\mathcal{J}$

  Anihilator of $\phi \leftrightarrow$ L: +i eigenbundle of $\mathcal{J}$ $\quad <\phi,\overline{\phi}>\neq 0 \Leftrightarrow L\cap\overline{L}=0$
- Integrability of $\mathcal{J} \Leftrightarrow \exists$ v and ξ s.t $d\varphi=(\iota_v+\xi\wedge)\varphi$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
Algebra	Clifford 6 $\{\gamma^m,\gamma^n\}=g^{mn}$	Clifford (6,6) $\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0,\ \{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

- On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$.
  $\Omega \in S \quad e^{iJ} \in S^+$
- Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ},e^{-iJ}>\neq 0$
- 1-1 correspondence between pure spinors ϕ with $<\phi,\overline{\phi}>\neq 0$ and GACS $\mathcal{J}$

  Anihilator of $\phi \leftrightarrow$ L: +i eigenbundle of $\mathcal{J}$ $\quad <\phi,\overline{\phi}>\neq 0 \Leftrightarrow L\cap\overline{L}=0$
- Integrability of $\mathcal{J} \Leftrightarrow \exists$ v and ξ s.t $d\varphi=(\iota_v+\xi\wedge)\varphi$

Review of pure spinors of Spin(d,d) and GACS

	T	$T \oplus T^*$
	Clifford 6	Clifford (6,6)
Algebra	$\{\gamma^m,\gamma^n\}=g^{mn}$	$\{\gamma^m,\gamma^n\}=\{\gamma_m,\gamma_n\}=0$, $\{\gamma^m,\gamma_n\}=\delta^m{}_n$
Representation terms of forms	$\gamma^i=dz^i\wedge$ and $\gamma^{\bar{i}}=g^{\bar{i}j}\iota_{\partial_j}$	$\gamma^m=dx^m\wedge$ and $\gamma_m=\iota_{\partial_m}$
Clifford vacuum	Ω	Ω
Pure spinor	$\gamma^i\,\Omega=0$	$\gamma^i\,\Omega=\gamma_{\bar{i}}\,\Omega=0$
Basis	Ω : (3,0) $\gamma^{\bar{i}}\,\Omega$: (2,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (0,0)	Ω : (3,0) $\quad$ $\gamma_i\Omega$: (2,0) $\gamma^{\bar{i}}\,\Omega$: (3,1) $\quad$ $\gamma_{ij}\,\Omega$: (1,0) $\gamma^{\bar{i}\bar{j}}\,\Omega$: (3,2) $\quad$ $\gamma_{ijk}\,\Omega$: (0,0) $\gamma^{\bar{i}\bar{j}\bar{k}}\,\Omega$: (3,3)
	Spinors $\leftrightarrow$ (p,0) forms	Spinors $\leftrightarrow$ (p,q) forms

$$e^{iJ}=1+iJ-\frac{1}{2}J^2-i\frac{1}{3!}J^3$$

$$(\gamma_m + i\,J_{mn}\,\gamma^n)\,e^{iJ}=0$$

Irreducible representations of Spin(6,6): $S^{\pm}=\Lambda^{ev,odd}\,T^*$

- On a manifold with SU(3) structure in T ➜ 2 pure spinors of Spin(6,6) $\quad \Omega\,;\ e^{iJ}$. (Ω: S, e^{iJ}: S^+)
- Such that $<\Omega,\overline{\Omega}>\neq 0$ and $<e^{iJ},e^{-iJ}>\neq 0$
- 1-1 correspondence between pure spinors ϕ with $<\phi,\overline{\phi}>\neq 0$ and GACS $\mathcal{J}$

  Anihilator of $\phi \leftrightarrow$ L: +i eigenbundle of $\mathcal{J}$ $\quad <\phi,\overline{\phi}>\neq 0 \Leftrightarrow L\cap\overline{L}=0$
- Integrability of $\mathcal{J} \Leftrightarrow \exists$ v and ξ s.t $d\varphi=(\iota_v+\xi\wedge)\varphi$

Under this 1-1 correspondence

$$\Omega \downarrow$$

$$\mathcal{J}_{\mathsf{J}} = \begin{pmatrix} \tilde{J} & 0 \\ 0 & -\tilde{J}^t \end{pmatrix}$$

Under this 1-1 correspondence

$$\mathcal{J}_{\mathsf{J}} = \begin{pmatrix} \tilde{J} & 0 \\ 0 & -\tilde{J}^t \end{pmatrix} \qquad \mathcal{J}_{\mathsf{W}} = \begin{pmatrix} 0 & -J^{-1} \\ J & 0 \end{pmatrix}$$

$\Omega \downarrow$ $\qquad$ $e^{iJ} \downarrow$

Under this 1-1 correspondence

$$\Omega \downarrow \qquad\qquad e^{iJ} \downarrow$$

$$\mathcal{J}_J = \begin{pmatrix} \tilde{J} & 0 \\ 0 & -\tilde{J}^t \end{pmatrix} \qquad \mathcal{J}_W = \begin{pmatrix} 0 & -J^{-1} \\ J & 0 \end{pmatrix}$$

Generalized Calabi-Yau :

Under this 1-1 correspondence

$$\Omega \qquad\qquad e^{iJ}$$
$$\downarrow \qquad\qquad \downarrow$$
$$\mathcal{J}_{\tilde{J}} = \begin{pmatrix} \tilde{J} & 0 \\ 0 & -\tilde{J}^t \end{pmatrix} \qquad \mathcal{J}_{W} = \begin{pmatrix} 0 & -J^{-1} \\ J & 0 \end{pmatrix}$$

Generalized Calabi-Yau :

Generalized Calabi-Yau ➜ A manifold that has one closed pure spinor $(d\varphi = 0)$

Under this 1-1 correspondence

$$\Omega \qquad\qquad e^{iJ}$$
$$\downarrow \qquad\qquad \downarrow$$
$$\mathcal{J}_{\tilde{J}} = \begin{pmatrix} \tilde{J} & 0 \\ 0 & -\tilde{J}^t \end{pmatrix} \qquad \mathcal{J}_{W} = \begin{pmatrix} 0 & -J^{-1} \\ J & 0 \end{pmatrix}$$

Generalized Calabi-Yau :

Generalized Calabi-Yau ➞ A manifold that has one closed pure spinor $(d\varphi = 0)$

⇩

has one GCS

Supersymmetry equations written in terms of pure spinors

Supersymmetry equations written in terms of pure spinors

Gravitino variation

Supersymmetry equations written in terms of pure spinors

Gravitino variation

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

Supersymmetry equations written in terms of pure spinors

Gravitino variation

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

- Write SUSY eqs. using basis for spinors: $\eta, \gamma^m\eta$ $\boxed{\gamma_{mn}\eta = iRe(\Omega)_{mnp}\gamma^p\eta + iJ_{mn}\gamma\eta}$

Supersymmetry equations written in terms of pure spinors

Gravitino variation

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

- Write SUSY eqs. using basis for spinors: $\eta, \gamma^m\eta$ $\boxed{\gamma_{mn}\eta = iRe(\Omega)_{mnp}\gamma^p\eta + iJ_{mn}\gamma\eta}$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

Supersymmetry equations written in terms of pure spinors

Gravitino variation

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

- Write SUSY eqs. using basis for spinors: $\eta, \gamma^m\eta$ $\boxed{\gamma_{mn}\eta = iRe(\Omega)_{mnp}\gamma^p\eta + iJ_{mn}\gamma\eta}$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

Torsion + NS flux

Supersymmetry equations written in terms of pure spinors

Gravitino variation

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

- Write SUSY eqs. using basis for spinors: $\eta, \gamma^m\eta$ $\boxed{\gamma_{mn}\eta = iRe(\Omega)_{mnp}\gamma^p\eta + iJ_{mn}\gamma\eta}$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

Torsion + NS flux

$\nabla_m \eta$ $H_{mnp}\gamma^{np}\eta$

Supersymmetry equations written in terms of pure spinors

Gravitino variation

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

- Write SUSY eqs. using basis for spinors: $\eta, \gamma^m\eta$ $\boxed{\gamma_{mn}\eta = iRe(\Omega)_{mnp}\gamma^p\eta + iJ_{mn}\gamma\eta}$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

RR flux
$\Sigma F_n \gamma_m \eta$

Supersymmetry equations written in terms of pure spinors

Gravitino variation

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

- Write SUSY eqs. using basis for spinors: $\eta, \gamma^m\eta$ $\boxed{\gamma_{mn}\eta = iRe(\Omega)_{mnp}\gamma^p\eta + iJ_{mn}\gamma\eta}$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

- Torsion + NS flux

Use $dJ = \mathrm{Im}(W1\,\Omega) + W3 + W4 \wedge J$
$d\Omega = W1\,J2 + W2 \wedge J + W5 \wedge \Omega$

Supersymmetry equations written in terms of pure spinors

Gravitino variation

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

- Write SUSY eqs. using basis for spinors: $\eta, \gamma^m\eta$ $\boxed{\gamma_{mn}\eta = iRe(\Omega)_{mnp}\gamma^p\eta + iJ_{mn}\gamma\eta}$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

- Torsion + NS flux

Use $dJ = \mathrm{Im}(W1\,\Omega) + W3 + W4 \wedge J$

$d\Omega = W1\,J2 + W2 \wedge J + W5 \wedge \Omega$

and $\eta^\dagger\gamma_{mn}\gamma\eta = i\,J_{mn}$

$\eta^\dagger\gamma_{mnp}(1+\gamma)\eta = i\,\Omega_{mnp}$

Supersymmetry equations written in terms of pure spinors

Gravitino variation

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

- Write SUSY eqs. using basis for spinors: $\eta, \gamma^m\eta$ $\boxed{\gamma_{mn}\eta = iRe(\Omega)_{mnp}\gamma^p\eta + iJ_{mn}\gamma\eta}$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

- Torsion + NS flux

Use $dJ = Im(W1\,\Omega) + W3 + W4 \wedge J$

$d\Omega = W1\,J2 + W2 \wedge J + W5 \wedge \Omega$

and $\eta^\dagger\gamma_{mn}\gamma\eta = i\,J_{mn}$

$\eta^\dagger\gamma_{mnp}(1+\gamma)\eta = i\,\Omega_{mnp}$

to get $\nabla_m \eta$

Supersymmetry equations written in terms of pure spinors

Gravitino variation

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

- Write SUSY eqs. using basis for spinors: $\eta, \gamma^m\eta$ $\boxed{\gamma_{mn}\eta = iRe(\Omega)_{mnp}\gamma^p\eta + iJ_{mn}\gamma\eta}$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

- Torsion + NS flux

Use $dJ = Im(W1\,\Omega) + W3 + W4 \wedge J$

$d\Omega = W1\,J2 + W2 \wedge J + W5 \wedge \Omega$

and $\eta^\dagger\gamma_{mn}\gamma\eta = i\,J_{mn}$

$\eta^\dagger\gamma_{mnp}(1+\gamma)\eta = i\,\Omega_{mnp}$

to get $\nabla_m \eta$

$$\left(\nabla_m + \frac{1}{8}H_{mnp}\,\gamma np\right)\eta = i(Q_m + Q_{mn}\gamma^n)\eta$$
$$= (W_4 + W_5 + iH^{(3)})_m\eta$$
$$+ \left[(W_1 + iH^{(1)})g_{mn} + \left(W_3 + iH^{(6)} + W_2\right)_{mn}\right]\gamma^n\eta$$

Supersymmetry equations written in terms of pure spinors

Gravitino variation

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

- Write SUSY eqs. using basis for spinors: $\eta, \gamma^m\eta$ $\boxed{\gamma_{mn}\eta = iRe(\Omega)_{mnp}\gamma^p\eta + iJ_{mn}\gamma\eta}$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

- Torsion + NS flux

Use $dJ = \mathrm{Im}(W1\,\Omega) + W3 + W4 \wedge J$

$d\Omega = W1\,J2 + W2 \wedge J + W5 \wedge \Omega$

and $\eta^\dagger\gamma_{mn}\gamma\eta = i\,J_{mn}$

$\eta^\dagger\gamma_{mnp}(1+\gamma)\eta = i\,\Omega_{mnp}$

to get $\nabla_m \eta$

$$\left(\nabla_m + \frac{1}{8}H_{mnp}\gamma np\right)\eta = i(Q_m + Q_{mn}\gamma^n)\eta$$
$$= (W_4 + W_5 + iH^{(3)})_m\eta$$
$$+ \left[(W_1 + iH^{(1)})g_{mn} + \left(W_3 + iH^{(6)} + W_2\right)_{mn}\right]\gamma^n\eta$$

$Q_m : 3+\overline{3}$

Supersymmetry equations written in terms of pure spinors

Gravitino variation

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

- Write SUSY eqs. using basis for spinors: $\eta, \gamma^m\eta$ $\boxed{\gamma_{mn}\eta = iRe(\Omega)_{mnp}\gamma^p\eta + iJ_{mn}\gamma\eta}$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

- Torsion + NS flux

Use $dJ = \mathrm{Im}(W1\,\Omega) + W3 + W4 \wedge J$

$d\Omega = W1\,J2 + W2 \wedge J + W5 \wedge \Omega$

and $\eta^\dagger\gamma_{mn}\gamma\eta = i\,J_{mn}$

$\eta^\dagger\gamma_{mnp}(1+\gamma)\eta = i\,\Omega_{mnp}$

to get $\nabla_m \eta$

$$\left(\nabla_m + \frac{1}{8}H_{mnp}\gamma np\right)\eta = i(Q_m + Q_{mn}\gamma^n)\eta$$
$$= (W_4 + W_5 + iH^{(3)})_m\eta$$
$$+ \left[(W_1 + iH^{(1)})g_{mn} + \left(W_3 + iH^{(6)} + W_2\right)_{mn}\right]\gamma^n\eta$$

$Q_m : 3+\overline{3}$ $\quad Q_{mn} \to Q_{ij}: 6 \oplus \overline{3}$

$Q \to 1 \oplus 8$

Supersymmetry equations written in terms of pure spinors

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

Supersymmetry equations written in terms of pure spinors

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

Supersymmetry equations written in terms of pure spinors

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

- RR flux

$$\frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\eta \quad = i(R_m + R_{mn}\gamma^n)\eta$$

Supersymmetry equations written in terms of pure spinors

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

- RR flux

$$\frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\eta \quad = i(R_m + R_{mn}\gamma^n)\eta$$

$$= e^{\phi}(e^{-iJ}F^B)_m\,\eta + e^{\phi}\left[(F^B_m\Omega)_n + (F^B\Omega)_0\,g_{mn} + (F^B\Omega)_{mn}\right]\gamma^n\eta \qquad \text{IIB}$$

Supersymmetry equations written in terms of pure spinors

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

- RR flux

$$\frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\eta = i(R_m + R_{mn}\gamma^n)\eta$$

$$= e^{\phi}(e^{-iJ}F^B)_m\,\eta + e^{\phi}\left[(F^B_m\Omega)_n + (F^B\Omega)_0\,g_{mn} + (F^B\Omega)_{mn}\right]\gamma^n\eta \qquad \text{IIB}$$

$$F^B = F_1 + F_3 + F_5$$

Supersymmetry equations written in terms of pure spinors

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

- RR flux

$$\frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\eta \quad = i(R_m + R_{mn}\gamma^n)\eta$$

$$= e^{\phi}(e^{-iJ}F^B)_m\,\eta + e^{\phi}\left[(F^B_m\Omega)_n + (F^B\Omega)_0\,g_{mn} + (F^B\Omega)_{mn}\right]\gamma^n\eta \qquad \text{IIB}$$

$$F^B = F_1 + F_3 + F_5$$

Clifford products: $(F\Omega)_{mn} \equiv (\not{F}\ \not{\Omega})_{mn} = \left(F_{i_1\ldots i_k}\Omega_{abc}\gamma^{i_1\ldots i_k}\gamma^{abc}\right)_{mn}$

Supersymmetry equations written in terms of pure spinors

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

- RR flux

$$\frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\eta = i(R_m + R_{mn}\gamma^n)\eta$$

$$= e^{\phi}(e^{-iJ}F^B)_m\,\eta + e^{\phi}\left[(F^B_m\Omega)_n + (F^B\Omega)_0\,g_{mn} + (F^B\Omega)_{mn}\right]\gamma^n\eta \qquad \text{IIB}$$

$$F^B = F_1 + F_3 + F_5$$

Clifford products: $(F\Omega)_{mn} \equiv (\not{F}\ \not{\Omega})_{mn} = \left(F_{i_1\ldots i_k}\Omega_{abc}\gamma^{i_1\ldots i_k}\gamma^{abc}\right)_{mn}$

terms with k+ 3,k+1,k-1, k-3 γ's

Supersymmetry equations written in terms of pure spinors

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

- RR flux

$$\frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\eta = i(R_m + R_{mn}\gamma^n)\eta$$

$$= e^{\phi}(e^{-iJ}F^B)_m\,\eta + e^{\phi}\left[(F^B_m\Omega)_n + (F^B\Omega)_0\,g_{mn} + (F^B\Omega)_{mn}\right]\gamma^n\eta \qquad \text{IIB}$$

$$F^B = F_1 + F_3 + F_5$$

Clifford products: $(F\Omega)_{mn} \equiv (\not{F}\ \not{\Omega})_{mn} = \left(F_{i_1\ldots i_k}\Omega_{abc}\gamma^{i_1\ldots i_k}\gamma^{abc}\right)_{mn}$

terms with k+ 3,k+1,k-1, k-3 γ's

Take coefficient of term with 2 γ's

Supersymmetry equations written in terms of pure spinors

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

- RR flux

$$\frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\eta = i(R_m + R_{mn}\gamma^n)\eta$$

$$= e^{\phi}(e^{-iJ}F^B)_m\,\eta + e^{\phi}\left[(F^B_m\Omega)_n + (F^B\Omega)_0\,g_{mn} + (F^B\Omega)_{mn}\right]\gamma^n\eta \qquad \text{IIB}$$

$$F^B = F_1 + F_3 + F_5$$

Clifford products: $(F\Omega)_{mn} \equiv (\not{F}\ \not{\Omega})_{mn} = \left(F_{i_1\ldots i_k}\Omega_{abc}\gamma^{i_1\ldots i_k}\gamma^{abc}\right)_{mn}$

terms with k+ 3,k+1,k-1, k-3 γ's

Take coefficient of term with 2 γ's

Ex: $(F_1\Omega)_{mn} = (F_i\,\Omega_{abc}\gamma^i\gamma^{abc})_{mn} = \frac{1}{2}F^a\Omega_{amn}$

Supersymmetry equations written in terms of pure spinors

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

- RR flux

$$\frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\eta = i(R_m + R_{mn}\gamma^n)\eta$$

$$= e^{\phi}(e^{-iJ}F^B)_m\,\eta + e^{\phi}\left[(F^B_m\Omega)_n + (F^B\Omega)_0\,g_{mn} + (F^B\Omega)_{mn}\right]\gamma^n\eta \qquad \text{IIB}$$

$$= e^{\phi}(\bar{\Omega}F^A)_m\,\eta + e^{\phi}\left[(F^A_m e^{iJ})_n + (F^A e^{iJ})_0\,g_{mn} + (F^A e^{iJ})_{mn}\right]\gamma^n\eta \qquad \text{IIA}$$

$$F^B = F_1 + F_3 + F_5$$

Clifford products: $(F\Omega)_{mn} \equiv (\not{F}\ \not{\Omega})_{mn} = \left(F_{i_1\ldots i_k}\Omega_{abc}\gamma^{i_1\ldots i_k}\gamma^{abc}\right)_{mn}$

terms with k+ 3,k+1,k-1, k-3 γ's

Take coefficient of term with 2 γ's

Ex: $(F_1\Omega)_{mn} = (F_i\,\Omega_{abc}\,\gamma^i\gamma^{abc})_{mn} = \frac{1}{2}F^a\Omega_{amn}$

Supersymmetry equations written in terms of pure spinors

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

- RR flux

$$\frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\eta = i(R_m + R_{mn}\gamma^n)\eta$$

$$= e^{\phi}(e^{-iJ}F^B)_m\,\eta + e^{\phi}\left[(F^B_m\Omega)_n + (F^B\Omega)_0\,g_{mn} + (F^B\Omega)_{mn}\right]\gamma^n\eta \qquad \text{IIB}$$

$$= e^{\phi}(\bar{\Omega}F^A)_m\,\eta + e^{\phi}\left[(F^A_m e^{iJ})_n + (F^A e^{iJ})_0\,g_{mn} + (F^A e^{iJ})_{mn}\right]\gamma^n\eta \qquad \text{IIA}$$

$$F^B = F_1 + F_3 + F_5$$

$$F^A = F_0 + F_2 + F_4$$

Clifford products: $(F\Omega)_{mn} \equiv (\not{F}\ \not{\Omega})_{mn} = \left(F_{i_1\ldots i_k}\Omega_{abc}\gamma^{i_1\ldots i_k}\gamma^{abc}\right)_{mn}$

terms with k+ 3,k+1,k-1, k-3 γ's

Take coefficient of term with 2 γ's

Ex: $(F_1\Omega)_{mn} = (F_i\,\Omega_{abc}\gamma^i\gamma^{abc})_{mn} = \frac{1}{2}F^a\Omega_{amn}$

Supersymmetry equations written in terms of pure spinors

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

- RR flux

$$\frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\eta = i(R_m + R_{mn}\gamma^n)\eta$$

$$= e^{\phi}(e^{-iJ}F^B)_m\,\eta + e^{\phi}\left[(F^B_m\Omega)_n + (F^B\Omega)_0\,g_{mn} + (F^B\Omega)_{mn}\right]\gamma^n\eta \qquad \text{IIB}$$

$$= e^{\phi}(\bar{\Omega}F^A)_m\,\eta + e^{\phi}\left[(F^A_m e^{iJ})_n + (F^A e^{iJ})_0\,g_{mn} + (F^A e^{iJ})_{mn}\right]\gamma^n\eta \qquad \text{IIA}$$

$$F^B = F_1 + F_3 + F_5$$

$$F^A = F_0 + F_2 + F_4$$

Clifford products: $(F\Omega)_{mn} \equiv (\not{F}\ \not{\Omega})_{mn} = \left(F_{i_1\ldots i_k}\Omega_{abc}\gamma^{i_1\ldots i_k}\gamma^{abc}\right)_{mn}$

terms with k+ 3,k+1,k-1, k-3 γ's

Take coefficient of term with 2 γ's

Ex: $(F_1\Omega)_{mn} = (F_i\,\Omega_{abc}\gamma^i\gamma^{abc})_{mn} = \frac{1}{2}F^a\Omega_{amn}$

Easiest way to do Cliff products: $\gamma^m = dx^m \wedge + \imath^m$ → satisfies $\{\gamma^m,\gamma^n\} = g^{mn}$

Supersymmetry equations written in terms of pure spinors

$$\delta\psi_m = \left(\nabla_m + \frac{1}{8}H_{mnp}\gamma^{np} + \frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\right)\eta$$

$$\delta\psi_m = i(Q_m + R_m)\eta + i(Q_{mn} + R_{mn})\gamma^n\eta$$

- RR flux

$$\frac{1}{16}e^{\phi}\sum_n \not{F}_n\gamma_m\eta = i(R_m + R_{mn}\gamma^n)\eta$$

$$= e^{\phi}(e^{-iJ}F^B)_m\,\eta + e^{\phi}\left[(F^B_m\Omega)_n + (F^B\Omega)_0\,g_{mn} + (F^B\Omega)_{mn}\right]\gamma^n\eta \qquad \text{IIB}$$

$$= e^{\phi}(\bar{\Omega}F^A)_m\,\eta + e^{\phi}\left[(F^A_m e^{iJ})_n + (F^A e^{iJ})_0\,g_{mn} + (F^A e^{iJ})_{mn}\right]\gamma^n\eta \qquad \text{IIA}$$

$$F^B = F_1 + F_3 + F_5$$

$$F^A = F_0 + F_2 + F_4$$

Clifford products: $(F\Omega)_{mn} \equiv (\not{F}\ \not{\Omega})_{mn} = \left(F_{i_1\ldots i_k}\Omega_{abc}\gamma^{i_1\ldots i_k}\gamma^{abc}\right)_{mn}$

terms with k+ 3,k+1,k-1, k-3 γ's

Take coefficient of term with 2 γ's

Ex: $(F_1\Omega)_{mn} = (F_i\,\Omega_{abc}\gamma^i\gamma^{abc})_{mn} = \frac{1}{2}F^a\Omega_{amn}$

Easiest way to do Cliff products: $\gamma^m = dx^m \wedge + \imath^m$ → satisfies $\{\gamma^m,\gamma^n\} = g^{mn}$

upersymmetry equations written in terms of pure spinors

$$\delta\,\psi_m$$

$$IIA : D_m^H\,\eta + e^{\phi}(\bar{\Omega}F^A)_m\,\eta + e^{\phi}\left[(F_m^A e^{iJ})_n + (F^A e^{iJ})_0\,g_{mn} + (F^A e^{iJ})_{mn}\right]\gamma^n\eta = 0$$

$$IIB : D_m^H\,\eta + e^{\phi}(e^{-iJ}F^B)_m\,\eta + e^{\phi}\left[(F_m^B\Omega)_n + (F^B\Omega)_0\,g_{mn} + (F^B\Omega)_{mn}\right]\gamma^n\eta = 0$$

upersymmetry equations written in terms of pure spinors

$$\delta\,\psi_m$$

$$IIA : D_m^H\,\eta + e^{\phi}(\bar{\Omega}F^A)_m\,\eta + e^{\phi}\left[(F_m^A e^{iJ})_n + (F^A e^{iJ})_0\,g_{mn} + (F^A e^{iJ})_{mn}\right]\gamma^n\eta = 0$$

$$IIB : D_m^H\,\eta + e^{\phi}(e^{-iJ}F^B)_m\,\eta + e^{\phi}\left[(F_m^B\Omega)_n + (F^B\Omega)_0\,g_{mn} + (F^B\Omega)_{mn}\right]\gamma^n\eta = 0$$

$$D_m^H\,\eta = (W_4 + W_5 + iH^{(3)})_m\eta + \left[(W_1 + iH^{(1)})g_{mn} + \left(W_3 + iH^{(6)} + W_2\right)_{mn}\right]\gamma^n\eta$$

upersymmetry equations written in terms of pure spinors

$$\delta\,\psi_m$$

$$IIA: D_m^H\,\eta + e^{\phi}(\bar{\Omega}F^A)_m\,\eta + e^{\phi}\left[(F_m^A e^{iJ})_n + (F^A e^{iJ})_0\,g_{mn} + (F^A e^{iJ})_{mn}\right]\gamma^n\eta = 0$$

$$IIB: D_m^H\,\eta + e^{\phi}(e^{-iJ}F^B)_m\,\eta + e^{\phi}\left[(F_m^B\Omega)_n + (F^B\Omega)_0\,g_{mn} + (F^B\Omega)_{mn}\right]\gamma^n\eta = 0$$

$$D_m^H\,\eta = (W_4 + W_5 + iH^{(3)})_m\eta + \left[(W_1 + iH^{(1)})g_{mn} + \left(W_3 + iH^{(6)} + W_2\right)_{mn}\right]\gamma^n\eta$$

$$= (W_4 + W_5 + (H\,e^{iJ})_m\eta + \left[(W_1 + i(H\,\Omega))g_{mn} + \left(W_3 + iH^{(6)} + W_2\right)_{mn}\right]\gamma^n\eta$$

upersymmetry equations written in terms of pure spinors

$$\delta\,\psi_m$$

$$IIA: D_m^H\,\eta + e^{\phi}(\bar{\Omega}F^A)_m\,\eta + e^{\phi}\left[(F_m^A e^{iJ})_n + (F^A e^{iJ})_0\,g_{mn} + (F^A e^{iJ})_{mn}\right]\gamma^n\eta = 0$$

$$IIB: D_m^H\,\eta + e^{\phi}(e^{-iJ}F^B)_m\,\eta + e^{\phi}\left[(F_m^B\Omega)_n + (F^B\Omega)_0\,g_{mn} + (F^B\Omega)_{mn}\right]\gamma^n\eta = 0$$

$$D_m^H\,\eta = (W_4 + W_5 + iH^{(3)})_m\eta + \left[(W_1 + iH^{(1)})g_{mn} + \left(W_3 + iH^{(6)} + W_2\right)_{mn}\right]\gamma^n\eta$$

$$= (W_4 + W_5 + (H\,e^{iJ})_m\eta + \left[(W_1 + i(H\,\Omega))g_{mn} + \left(W_3 + iH^{(6)} + W_2\right)_{mn}\right]\gamma^n\eta$$

RR fluxes: $F^A = F_0 + F_2 + F_4$ $\qquad$ $F^B = F_1 + F_3 + F_5$

IIA $\leftrightarrow$ IIB

upersymmetry equations written in terms of pure spinors

$$\delta\,\psi_m$$

$$IIA: D_m^H\,\eta + e^{\phi}(\bar{\Omega}F^A)_m\,\eta + e^{\phi}\left[(F_m^A e^{iJ})_n + (F^A e^{iJ})_0\,g_{mn} + (F^A e^{iJ})_{mn}\right]\gamma^n\eta = 0$$

$$IIB: D_m^H\,\eta + e^{\phi}(e^{-iJ}F^B)_m\,\eta + e^{\phi}\left[(F_m^B\Omega)_n + (F^B\Omega)_0\,g_{mn} + (F^B\Omega)_{mn}\right]\gamma^n\eta = 0$$

$$D_m^H\,\eta = (W_4 + W_5 + iH^{(3)})_m\eta + \left[(W_1 + iH^{(1)})g_{mn} + \left(W_3 + iH^{(6)} + W_2\right)_{mn}\right]\gamma^n\eta$$

$$= (W_4 + W_5 + (H\,e^{iJ})_m\eta + \left[(W_1 + i(H\,\Omega))g_{mn} + \left(W_3 + iH^{(6)} + W_2\right)_{mn}\right]\gamma^n\eta$$

RR fluxes: $F^A = F_0 + F_2 + F_4$ $\qquad$ $F^B = F_1 + F_3 + F_5$

IIA $\leftrightarrow$ IIB

$F^A \leftrightarrow F^B$

upersymmetry equations written in terms of pure spinors

$$\delta\,\psi_m$$

$$IIA: D_m^H\,\eta + e^{\phi}(\bar{\Omega}F^A)_m\,\eta + e^{\phi}\left[(F_m^A e^{iJ})_n + (F^A e^{iJ})_0\,g_{mn} + (F^A e^{iJ})_{mn}\right]\gamma^n\eta = 0$$

$$IIB: D_m^H\,\eta + e^{\phi}(e^{-iJ}F^B)_m\,\eta + e^{\phi}\left[(F_m^B\Omega)_n + (F^B\Omega)_0\,g_{mn} + (F^B\Omega)_{mn}\right]\gamma^n\eta = 0$$

$$D_m^H\,\eta = (W_4 + W_5 + iH^{(3)})_m\eta + \left[(W_1 + iH^{(1)})g_{mn} + \left(W_3 + iH^{(6)} + W_2\right)_{mn}\right]\gamma^n\eta$$

$$= (W_4 + W_5 + (H\,e^{iJ})_m\eta + \left[(W_1 + i(H\,\Omega))g_{mn} + \left(W_3 + iH^{(6)} + W_2\right)_{mn}\right]\gamma^n\eta$$

RR fluxes: $F^A = F_0 + F_2 + F_4$ $\qquad$ $F^B = F_1 + F_3 + F_5$

IIA $\leftrightarrow$ IIB

$F^A \leftrightarrow F^B$

$e^{iJ} \leftrightarrow \Omega$

upersymmetry equations written in terms of pure spinors

$$\delta\,\psi_m$$

$$IIA: D_m^H\eta + e^{\phi}(\bar{\Omega}F^A)_m\,\eta + e^{\phi}\left[(F_m^A e^{iJ})_n + (F^A e^{iJ})_0\, g_{mn} + (F^A e^{iJ})_{mn}\right]\gamma^n\eta = 0$$

$$IIB: D_m^H\eta + e^{\phi}(e^{-iJ}F^B)_m\,\eta + e^{\phi}\left[(F_m^B\Omega)_n + (F^B\Omega)_0\, g_{mn} + (F^B\Omega)_{mn}\right]\gamma^n\eta = 0$$

$$D_m^H\eta = (W_4 + W_5 + iH^{(3)})_m\eta + \left[(W_1 + iH^{(1)})g_{mn} + \left(W_3 + iH^{(6)} + W_2\right)_{mn}\right]\gamma^n\eta$$

$$= (W_4 + W_5 + (H\,e^{iJ})_m\eta + \left[(W_1 + i(H\,\Omega))g_{mn} + \left(W_3 + iH^{(6)} + W_2\right)_{mn}\right]\gamma^n\eta$$

RR fluxes: $F^A = F_0 + F_2 + F_4$ $\qquad$ $F^B = F_1 + F_3 + F_5$

IIA $\leftrightarrow$ IIB

$F^A \leftrightarrow F^B$

$e^{iJ} \leftrightarrow \Omega$

exchange of two pure spinors -- action of mirror symmetry

Fidanza, Minasian, Tomasiello '03

upersymmetry equations written in terms of pure spinors

$$\delta\,\psi_m$$

$$IIA: D_m^H\eta + e^{\phi}(\bar{\Omega}F^A)_m\,\eta + e^{\phi}\left[(F_m^A e^{iJ})_n + (F^A e^{iJ})_0\, g_{mn} + (F^A e^{iJ})_{mn}\right]\gamma^n\eta = 0$$

$$IIB: D_m^H\eta + e^{\phi}(e^{-iJ}F^B)_m\,\eta + e^{\phi}\left[(F_m^B\Omega)_n + (F^B\Omega)_0\, g_{mn} + (F^B\Omega)_{mn}\right]\gamma^n\eta = 0$$

$$D_m^H\eta = (W_4 + W_5 + iH^{(3)})_m\eta + \left[(W_1 + iH^{(1)})g_{mn} + \left(W_3 + iH^{(6)} + W_2\right)_{mn}\right]\gamma^n\eta$$

$$= (W_4 + W_5 + (H\,e^{iJ})_m\eta + \left[(W_1 + i(H\,\Omega))g_{mn} + \left(W_3 + iH^{(6)} + W_2\right)_{mn}\right]\gamma^n\eta$$

RR fluxes: $F^A = F_0 + F_2 + F_4$ $\qquad$ $F^B = F_1 + F_3 + F_5$

IIA $\leftrightarrow$ IIB

$F^A \leftrightarrow F^B$

$e^{iJ} \leftrightarrow \Omega$

exchange of two pure spinors -- action of mirror symmetry

Fidanza, Minasian, Tomasiello '03

These are modified RR fluxes: $F_n = dC_{n-1} - dB \wedge C_{n-3}$

upersymmetry equations written in terms of pure spinors

$$\delta\,\psi_m$$

$$IIA: D_m^H\eta + e^{\phi}(\bar{\Omega}F^A)_m\,\eta + e^{\phi}\left[(F_m^A e^{iJ})_n + (F^A e^{iJ})_0\, g_{mn} + (F^A e^{iJ})_{mn}\right]\gamma^n\eta = 0$$

$$IIB: D_m^H\eta + e^{\phi}(e^{-iJ}F^B)_m\,\eta + e^{\phi}\left[(F_m^B\Omega)_n + (F^B\Omega)_0\, g_{mn} + (F^B\Omega)_{mn}\right]\gamma^n\eta = 0$$

$$D_m^H\eta = (W_4 + W_5 + iH^{(3)})_m\eta + \left[(W_1 + iH^{(1)})g_{mn} + \left(W_3 + iH^{(6)} + W_2\right)_{mn}\right]\gamma^n\eta$$

$$= (W_4 + W_5 + (H\,e^{iJ})_m\eta + \left[(W_1 + i(H\,\Omega))g_{mn} + \left(W_3 + iH^{(6)} + W_2\right)_{mn}\right]\gamma^n\eta$$

RR fluxes: $F^A = F_0 + F_2 + F_4$ $\qquad$ $F^B = F_1 + F_3 + F_5$

IIA $\leftrightarrow$ IIB

$F^A \leftrightarrow F^B$

$e^{iJ} \leftrightarrow \Omega$

exchange of two pure spinors -- action of mirror symmetry

Fidanza, Minasian, Tomasiello '03

These are modified RR fluxes: $F_n = dC_{n-1} - dB \wedge C_{n-3}$

We see complexification $e^{B+iJ} \leftrightarrow \Omega$

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

→ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
→ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

→ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
→ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

→ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
→ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

  → Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
  → Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

→ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
→ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

→ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
→ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

→ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
→ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

→ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
→ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

  $\rightarrow$ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
  $\rightarrow$ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

$\rightarrow$ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
$\rightarrow$ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

- In practical terms: $\eta_+ \leftrightarrow \eta_-$ under T-duality

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

$\rightarrow$ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
$\rightarrow$ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

- In practical terms: $\eta_+ \leftrightarrow \eta_-$ under T-duality

In terms of Q's (torsion + NS flux)

$$Q_m \leftrightarrow -Q_m$$

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

$\rightarrow$ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
$\rightarrow$ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

- In practical terms: $\eta_+ \leftrightarrow \eta_-$ under T-duality

In terms of Q's (torsion + NS flux)

$$Q_m \leftrightarrow -Q_m$$
$$3 \leftrightarrow 3$$

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

$\rightarrow$ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
$\rightarrow$ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

- In practical terms: $\eta_+ \leftrightarrow \eta_-$ under T-duality

In terms of Q's (torsion + NS flux)

$$Q_m \leftrightarrow -Q_m \qquad Q_{ij} \leftrightarrow -Q_{i\bar{j}}$$

$$3 \leftrightarrow 3$$

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

→ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
→ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

- In practical terms: $\eta_+ \leftrightarrow \eta_-$ under T-duality

In terms of Q's (torsion + NS flux)

$$Q_m \leftrightarrow -Q_m \qquad Q_{ij} \leftrightarrow -Q_{i\bar{j}}$$

$$3 \leftrightarrow 3$$

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

$\rightarrow$ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
$\rightarrow$ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

- In practical terms: $\eta_+ \leftrightarrow \eta_-$ under T-duality

In terms of Q's (torsion + NS flux)

$$Q_m \leftrightarrow -Q_m \qquad Q_{ij} \leftrightarrow -Q_{i\bar{j}}$$

$$3 \leftrightarrow 3 \qquad 6 \oplus \bar{3} \leftrightarrow 8 \oplus 1$$

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

→ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
→ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

- In practical terms: $\eta_+ \leftrightarrow \eta_-$ under T-duality

In terms of Q's (torsion + NS flux)

$$Q_m \leftrightarrow -Q_m \qquad Q_{ij} \leftrightarrow -Q_{i\bar{j}}$$

$$3 \leftrightarrow 3 \qquad 6 \oplus \bar{3} \leftrightarrow 8 \oplus 1$$

- Mirror symmetry works exchanging representations of torsion + NSNS flux

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

→ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
→ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

- In practical terms: $\eta_+ \leftrightarrow \eta_-$ under T-duality

In terms of Q's (torsion + NS flux)

$$Q_m \leftrightarrow -Q_m \qquad Q_{ij} \leftrightarrow -Q_{i\bar{j}}$$

$$3 \leftrightarrow 3 \qquad 6 \oplus \bar{3} \leftrightarrow 8 \oplus 1$$

- Mirror symmetry works exchanging representations of torsion + NSNS flux

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

→ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
→ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

- In practical terms: $\eta_+ \leftrightarrow \eta_-$ under T-duality

In terms of Q's (torsion + NS flux)

$$Q_m \leftrightarrow -Q_m \qquad Q_{ij} \leftrightarrow -Q_{i\bar{j}}$$

$$3 \leftrightarrow 3 \qquad 6 \oplus \bar{3} \leftrightarrow 8 \oplus 1$$

- Mirror symmetry works exchanging representations of torsion + NSNS flux

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

$\rightarrow$ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
$\rightarrow$ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

- In practical terms: $\eta_+ \leftrightarrow \eta_-$ under T-duality

In terms of Q's (torsion + NS flux)

$$Q_m \leftrightarrow -Q_m \qquad Q_{ij} \leftrightarrow -Q_{i\bar{j}}$$

$$3 \leftrightarrow 3 \qquad 6 \oplus \bar{3} \leftrightarrow 8 \oplus 1$$

- Mirror symmetry works exchanging representations of torsion + NSNS flux

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

→ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
→ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

- In practical terms: $\eta_+ \leftrightarrow \eta_-$ under T-duality

In terms of Q's (torsion + NS flux)

$$Q_m \leftrightarrow -Q_m \qquad Q_{ij} \leftrightarrow -Q_{i\bar{j}}$$

$$3 \leftrightarrow 3 \qquad 6 \oplus \bar{3} \leftrightarrow 8 \oplus 1$$

- Mirror symmetry works exchanging representations of torsion + NSNS flux

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

$\rightarrow$ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
$\rightarrow$ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

- In practical terms: $\eta_+ \leftrightarrow \eta_-$ under T-duality

In terms of Q's (torsion + NS flux)

$$Q_m \leftrightarrow -Q_m \qquad Q_{ij} \leftrightarrow -Q_{i\bar{j}}$$
$$3 \leftrightarrow 3 \qquad 6 \oplus \bar{3} \leftrightarrow 8 \oplus 1$$

- Mirror symmetry works exchanging representations of torsion + NSNS flux

- Since susy vacua (Q + R = 0) are send via mirror symmetry to susy vacua

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

→ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
→ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

- In practical terms: $\eta_+ \leftrightarrow \eta_-$ under T-duality

In terms of Q's (torsion + NS flux)

$$Q_m \leftrightarrow -Q_m \qquad Q_{ij} \leftrightarrow -Q_{i\bar{j}}$$

$$3 \leftrightarrow 3 \qquad 6 \oplus \bar{3} \leftrightarrow 8 \oplus 1$$

- Mirror symmetry works exchanging representations of torsion + NSNS flux

- Since susy vacua (Q + R = 0) are send via mirror symmetry to susy vacua

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

→ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
→ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

- In practical terms: $\eta_+ \leftrightarrow \eta_-$ under T-duality

In terms of Q's (torsion + NS flux)

$$Q_m \leftrightarrow -Q_m \qquad Q_{ij} \leftrightarrow -Q_{i\bar{j}}$$
$$3 \leftrightarrow 3 \qquad 6 \oplus \bar{3} \leftrightarrow 8 \oplus 1$$

- Mirror symmetry works exchanging representations of torsion + NSNS flux

- Since susy vacua (Q + R = 0) are send via mirror symmetry to susy vacua

$$R_m \leftrightarrow -R_m \qquad R_{ij} \leftrightarrow -R_{i\bar{j}}$$
$$3 \leftrightarrow 3 \qquad 6 \oplus \bar{3} \leftrightarrow 8 \oplus 1$$

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

→ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
→ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

- In practical terms: $\eta_+ \leftrightarrow \eta_-$ under T-duality

In terms of Q's (torsion + NS flux)

$$Q_m \leftrightarrow -Q_m \qquad Q_{ij} \leftrightarrow -Q_{i\bar{j}}$$
$$3 \leftrightarrow 3 \qquad 6 \oplus \bar{3} \leftrightarrow 8 \oplus 1$$

- Mirror symmetry works exchanging representations of torsion + NSNS flux

- Since susy vacua (Q + R = 0) are send via mirror symmetry to susy vacua

$$R_m \leftrightarrow -R_m \qquad R_{ij} \leftrightarrow -R_{i\bar{j}}$$
$$3 \leftrightarrow 3 \qquad 6 \oplus \bar{3} \leftrightarrow 8 \oplus 1$$

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

→ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
→ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

- In practical terms: $\eta_+ \leftrightarrow \eta_-$ under T-duality

In terms of Q's (torsion + NS flux)

$$Q_m \leftrightarrow -Q_m \qquad Q_{ij} \leftrightarrow -Q_{i\bar{j}}$$
$$3 \leftrightarrow 3 \qquad 6 \oplus \bar{3} \leftrightarrow 8 \oplus 1$$

- Mirror symmetry works exchanging representations of torsion + NSNS flux

- Since susy vacua (Q + R = 0) are send via mirror symmetry to susy vacua

$$R_m \leftrightarrow -R_m \qquad R_{ij} \leftrightarrow -R_{i\bar{j}}$$
$$3 \leftrightarrow 3 \qquad 6 \oplus \bar{3} \leftrightarrow 8 \oplus 1$$

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

→ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
→ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

- In practical terms: $\eta_+ \leftrightarrow \eta_-$ under T-duality

In terms of Q's (torsion + NS flux)

$$Q_m \leftrightarrow -Q_m \qquad Q_{ij} \leftrightarrow -Q_{i\bar{j}}$$
$$3 \leftrightarrow 3 \qquad 6 \oplus \bar{3} \leftrightarrow 8 \oplus 1$$

- Mirror symmetry works exchanging representations of torsion + NSNS flux

- Since susy vacua (Q + R = 0) are send via mirror symmetry to susy vacua

$$R_m \leftrightarrow -R_m \qquad R_{ij} \leftrightarrow -R_{i\bar{j}}$$
$$3 \leftrightarrow 3 \qquad 6 \oplus \bar{3} \leftrightarrow 8 \oplus 1$$

Mirror symmetry

Fidanza, Minasian, Tomasiello

- Strominger-Yau-Zaslow conjecture

→ Every CY is a T^3 special Lagrangian fibration over 3 dimensional base
→ Mirror symmetry is T duality along T^3

- Assume our SU(3) structure manifold admits T^3 fibration

- Doing a Hodge star on fiber and 3 T-dualities $e^{iJ} \leftrightarrow \Omega$

- In practical terms: $\eta_+ \leftrightarrow \eta_-$ under T-duality

In terms of Q's (torsion + NS flux)

$$Q_m \leftrightarrow -Q_m \qquad Q_{ij} \leftrightarrow -Q_{i\bar{j}}$$
$$3 \leftrightarrow 3 \qquad 6 \oplus \bar{3} \leftrightarrow 8 \oplus 1$$

- Mirror symmetry works exchanging representations of torsion + NSNS flux

- Since susy vacua (Q + R = 0) are send via mirror symmetry to susy vacua

$$R_m \leftrightarrow -R_m \qquad R_{ij} \leftrightarrow -R_{i\bar{j}}$$
$$3 \leftrightarrow 3 \qquad 6 \oplus \bar{3} \leftrightarrow 8 \oplus 1$$

quations **for** pure spinors

quations **for** pure spinors

Pure spinors as bispinors

quations **for** pure spinors

Pure spinors as bispinors

ierz rearrangement: $\eta_\pm \otimes \eta_+^\dagger = \frac{1}{4}\sum_{k=0}^{6}\frac{1}{k!}\eta_+^\dagger \gamma_{i_1\ldots i_k}\eta_\pm \gamma^{i_1\ldots i_k}$

quations **for** pure spinors

Pure spinors as bispinors

ierz rearrangement: $\eta_\pm \otimes \eta_+^\dagger = \frac{1}{4}\sum_{k=0}^{6}\frac{1}{k!}\eta_+^\dagger \gamma_{i_1\ldots i_k}\eta_\pm \gamma^{i_1\ldots i_k}$ ➡ $\eta_+ \otimes \eta_+^\dagger = e^{iJ}$, $\eta_+ \otimes \eta_-^\dagger = i\,\Omega$

quations **for** pure spinors

Pure spinors as bispinors

ierz rearrangement: $\eta_\pm \otimes \eta_+^\dagger = \frac{1}{4}\sum_{k=0}^{6}\frac{1}{k!}\eta_+^\dagger \gamma_{i_1\ldots i_k}\eta_\pm \gamma^{i_1\ldots i_k}$ ➡ $\eta_+ \otimes \eta_+^\dagger = e^{iJ}$, $\eta_+ \otimes \eta_-^\dagger = i\,\Omega$

d $e^{iJ} = \lambda^m D_m (\eta_+ \otimes \eta_+^\dagger)$. $\delta\psi_m = 0$ gives $D_m\eta = (H\,\Omega)\,\eta + (F\,\Omega)\,\eta + \ldots$

quations **for** pure spinors

Pure spinors as bispinors

ierz rearrangement: $\eta_\pm \otimes \eta_+^\dagger = \frac{1}{4}\sum_{k=0}^{6}\frac{1}{k!}\eta_+^\dagger \gamma_{i_1\ldots i_k}\eta_\pm \gamma^{i_1\ldots i_k}$ ➡ $\eta_+ \otimes \eta_+^\dagger = e^{iJ}$, $\eta_+ \otimes \eta_-^\dagger = i\,\Omega$

d $e^{iJ} = \lambda^m D_m (\eta_+ \otimes \eta_+^\dagger)$. $\delta\psi_m = 0$ gives $D_m\eta = (H\,\Omega)\,\eta + (F\,\Omega)\,\eta + \ldots$ Using also dilatino eq we get

quations **for** pure spinors

Pure spinors as bispinors

ierz rearrangement: $\eta_\pm \otimes \eta_+^\dagger = \frac{1}{4}\sum_{k=0}^{6}\frac{1}{k!}\eta_+^\dagger \gamma_{i_1\dots i_k}\eta_\pm \gamma^{i_1\dots i_k}$ ➡ $\eta_+ \otimes \eta_+^\dagger = e^{iJ}$, $\eta_+ \otimes \eta_-^\dagger = i\,\Omega$

d $e^{iJ} = \lambda^m D_m (\eta_+ \otimes \eta_+^\dagger)$. $\delta\psi_m = 0$ gives $D_m\eta = (H\,\Omega)\,\eta + (F\,\Omega)\,\eta + \dots$ Using also dilatino eq we get

IIA	IIB
$e^{-f}d(e^f e^{iJ}) = \frac{Re(\alpha\bar{\beta})}{\lvert\alpha\rvert^2+\lvert\beta\rvert^2} H \bullet e^{iJ}$	$e^{-f}d(e^f e^{iJ}) = \frac{Re(\alpha\bar{\beta})}{\lvert\alpha\rvert^2+\lvert\beta\rvert^2} H \bullet e^{iJ} + F_B e^{iJ}$
$e^{-g}d(e^g\Omega) = \frac{\alpha^2+\beta^2}{2\alpha\beta} H \bullet \Omega + F_A e^{iJ}$	$e^{-g}d(e^g\Omega) = \frac{\alpha^2+\beta^2}{2\alpha\beta} H \bullet \Omega$

quations **for** pure spinors

Pure spinors as bispinors

ierz rearrangement: $\eta_\pm \otimes \eta_+^\dagger = \frac{1}{4}\sum_{k=0}^{6}\frac{1}{k!}\eta_+^\dagger \gamma_{i_1\dots i_k}\eta_\pm \gamma^{i_1\dots i_k}$ ➡ $\eta_+ \otimes \eta_+^\dagger = e^{iJ}$, $\eta_+ \otimes \eta_-^\dagger = i\,\Omega$

d $e^{iJ} = \lambda^m D_m (\eta_+ \otimes \eta_+^\dagger)$. $\delta\psi_m = 0$ gives $D_m\eta = (H\,\Omega)\,\eta + (F\,\Omega)\,\eta + \dots$ Using also dilatino eq we get

IIA	IIB
$e^{-f}d(e^f e^{iJ}) = \frac{Re(\alpha\bar{\beta})}{\lvert\alpha\rvert^2+\lvert\beta\rvert^2} H \bullet e^{iJ}$	$e^{-f}d(e^f e^{iJ}) = \frac{Re(\alpha\bar{\beta})}{\lvert\alpha\rvert^2+\lvert\beta\rvert^2} H \bullet e^{iJ} + F_B e^{iJ}$
$e^{-g}d(e^g\Omega) = \frac{\alpha^2+\beta^2}{2\alpha\beta} H \bullet \Omega + F_A e^{iJ}$	$e^{-g}d(e^g\Omega) = \frac{\alpha^2+\beta^2}{2\alpha\beta} H \bullet \Omega$

quations **for** pure spinors

$$\varepsilon^1 = a\,\theta_+ \otimes \eta_+ + c.c. \qquad \alpha \equiv a + ib$$
$$\varepsilon^2 = b\,\theta_+ \otimes \eta_+ + c.c. \qquad \beta \equiv a - ib$$

Pure spinors as bispinors

ierz rearrangement: $\eta_\pm \otimes \eta_+^\dagger = \frac{1}{4}\sum_{k=0}^{6} \frac{1}{k!}\eta_+^\dagger \gamma_{i_1\ldots i_k}\eta_\pm \gamma^{i_1\ldots i_k}$ ➡ $\eta_+ \otimes \eta_+^\dagger = e^{iJ}$, $\eta_+ \otimes \eta_-^\dagger = i\,\Omega$

d $e^{iJ} = \lambda^m D_m (\eta_+ \otimes \eta_+^\dagger)$. $\delta\psi_m = 0$ gives $D_m\eta = (H\,\Omega)\,\eta + (F\,\Omega)\,\eta + \ldots$ Using also dilatino eq we get

IIA	IIB
$e^{-f}d(e^f e^{iJ}) = \frac{Re(\alpha\bar{\beta})}{\lvert\alpha\rvert^2 + \lvert\beta\rvert^2} H \bullet e^{iJ}$	$e^{-f}d(e^f e^{iJ}) = \frac{Re(\alpha\bar{\beta})}{\lvert\alpha\rvert^2 + \lvert\beta\rvert^2} H \bullet e^{iJ} + F_B e^{iJ}$
$e^{-g}d(e^g\Omega) = \frac{\alpha^2 + \beta^2}{2\alpha\beta} H \bullet \Omega + F_A e^{iJ}$	$e^{-g}d(e^g\Omega) = \frac{\alpha^2 + \beta^2}{2\alpha\beta} H \bullet \Omega$

quations **for** pure spinors

$$\varepsilon^1 = a\,\theta_+ \otimes \eta_+ + c.c. \qquad \alpha \equiv a + ib$$
$$\varepsilon^2 = b\,\theta_+ \otimes \eta_+ + c.c. \qquad \beta \equiv a - ib$$

Pure spinors as bispinors

ierz rearrangement: $\eta_\pm \otimes \eta_+^\dagger = \frac{1}{4}\sum_{k=0}^{6} \frac{1}{k!}\eta_+^\dagger \gamma_{i_1\ldots i_k}\eta_\pm \gamma^{i_1\ldots i_k}$ ➡ $\eta_+ \otimes \eta_+^\dagger = e^{iJ}$, $\eta_+ \otimes \eta_-^\dagger = i\,\Omega$

d $e^{iJ} = \lambda^m D_m (\eta_+ \otimes \eta_+^\dagger)$. $\delta\psi_m = 0$ gives $D_m\eta = (H\,\Omega)\,\eta + (F\,\Omega)\,\eta + \ldots$ Using also dilatino eq we get

IIA	IIB
$e^{-f}d(e^f e^{iJ}) = \frac{Re(\alpha\bar\beta)}{\lvert\alpha\rvert^2+\lvert\beta\rvert^2} H \bullet e^{iJ}$	$e^{-f}d(e^f e^{iJ}) = \frac{Re(\alpha\bar\beta)}{\lvert\alpha\rvert^2+\lvert\beta\rvert^2} H \bullet e^{iJ} + F_B e^{iJ}$
$e^{-g}d(e^g\Omega) = \frac{\alpha^2+\beta^2}{2\alpha\beta} H \bullet \Omega + F_A e^{iJ}$	$e^{-g}d(e^g\Omega) = \frac{\alpha^2+\beta^2}{2\alpha\beta} H \bullet \Omega$

$$e^{iJ} = -\frac{e^\phi}{16}\frac{1}{2\alpha\beta}\left(F\cdot(-\frac{1}{4}e^{-iJ}+1+ivol) - (-\frac{1}{4}e^{-iJ}+1+ivol)\cdot F^*\right)$$

$$= (\lvert\alpha\rvert^2 - \lvert\beta\rvert^2)(F_0+F_4) + (\alpha\bar\beta - \bar\alpha\beta)(F_2+F_6)$$

quations **for** pure spinors

$$\varepsilon^1 = a\,\theta_+ \otimes \eta_+ + c.c. \qquad \alpha \equiv a + ib$$
$$\varepsilon^2 = b\,\theta_+ \otimes \eta_+ + c.c. \qquad \beta \equiv a - ib$$

Pure spinors as bispinors

ierz rearrangement: $\eta_\pm \otimes \eta_+^\dagger = \frac{1}{4}\sum_{k=0}^{6}\frac{1}{k!}\eta_+^\dagger \gamma_{i_1\ldots i_k}\eta_\pm \gamma^{i_1\ldots i_k}$ ➡ $\eta_+ \otimes \eta_+^\dagger = e^{iJ}$, $\eta_+ \otimes \eta_-^\dagger = i\,\Omega$

d $e^{iJ} = \lambda^m D_m (\eta_+ \otimes \eta_+^\dagger)$. $\delta\psi_m = 0$ gives $D_m\eta = (H\,\Omega)\,\eta + (F\,\Omega)\,\eta + \ldots$ Using also dilatino eq we get

IIA	IIB
$e^{-f}d(e^f e^{iJ}) = \frac{Re(\alpha\bar\beta)}{\lvert\alpha\rvert^2+\lvert\beta\rvert^2} H \bullet e^{iJ}$	$e^{-f}d(e^f e^{iJ}) = \frac{Re(\alpha\bar\beta)}{\lvert\alpha\rvert^2+\lvert\beta\rvert^2} H \bullet e^{iJ} + F_B e^{iJ}$
$e^{-g}d(e^g\Omega) = \frac{\alpha^2+\beta^2}{2\alpha\beta} H \bullet \Omega + F_A e^{iJ}$	$e^{-g}d(e^g\Omega) = \frac{\alpha^2+\beta^2}{2\alpha\beta} H \bullet \Omega$
$e^{iJ} = -\frac{e^\phi}{16}\frac{1}{2\alpha\beta}\left(F\cdot(-\frac{1}{4}e^{-iJ}+1+ivol) - (-\frac{1}{4}e^{-iJ}+1+ivol)\cdot F^*\right)$	$F_B\, e^{iJ} = i\frac{e^\phi}{16}\frac{1}{\lvert\alpha\rvert^2+\lvert\beta\rvert^2}\left(F\cdot(-\frac{1}{4}e^{-iJ}+1+ivol) - (-2e^{-iJ}+1+ivol)\cdot F\right)$
$= (\lvert\alpha\rvert^2-\lvert\beta\rvert^2)(F_0+F_4)+(\alpha\bar\beta-\bar\alpha\beta)(F_2+F_6)$	$F = (\lvert\alpha\rvert^2-\lvert\beta\rvert^2)(F_1+F_5)+(\alpha\bar\beta-\bar\alpha\beta)(F_3)$

quations **for** pure spinors

$$\varepsilon^1 = a\,\theta_+ \otimes \eta_+ + c.c. \qquad \alpha \equiv a + ib$$
$$\varepsilon^2 = b\,\theta_+ \otimes \eta_+ + c.c. \qquad \beta \equiv a - ib$$

Pure spinors as bispinors

ierz rearrangement: $\eta_\pm \otimes \eta_+^\dagger = \frac{1}{4}\sum_{k=0}^{6} \frac{1}{k!}\eta_+^\dagger \gamma_{i_1\ldots i_k}\eta_\pm \gamma^{i_1\ldots i_k}$ ➡ $\eta_+ \otimes \eta_+^\dagger = e^{iJ}$, $\eta_+ \otimes \eta_-^\dagger = i\,\Omega$

d $e^{iJ} = \lambda^m D_m (\eta_+ \otimes \eta_+^\dagger)$. $\delta\psi_m = 0$ gives $D_m\eta = (H\,\Omega)\,\eta + (F\,\Omega)\,\eta + \ldots$ Using also dilatino eq we get

IIA	IIB
$e^{-f}d(e^f e^{iJ}) = \frac{Re(\alpha\bar\beta)}{\lvert\alpha\rvert^2+\lvert\beta\rvert^2} H \bullet e^{iJ}$	$e^{-f}d(e^f e^{iJ}) = \frac{Re(\alpha\bar\beta)}{\lvert\alpha\rvert^2+\lvert\beta\rvert^2} H \bullet e^{iJ} + F_B e^{iJ}$
$e^{-g}d(e^g\Omega) = \frac{\alpha^2+\beta^2}{2\alpha\beta} H \bullet \Omega + F_A e^{iJ}$	$e^{-g}d(e^g\Omega) = \frac{\alpha^2+\beta^2}{2\alpha\beta} H \bullet \Omega$
$e^{iJ} = -\frac{e^\phi}{16}\frac{1}{2\alpha\beta}\left(F\cdot(-\frac{1}{4}e^{-iJ}+1+ivol) - (-\frac{1}{4}e^{-iJ}+1+ivol)\cdot F^*\right)$	$F_B\, e^{iJ} = i\frac{e^\phi}{16}\frac{1}{\lvert\alpha\rvert^2+\lvert\beta\rvert^2}\left(F\cdot(-\frac{1}{4}e^{-iJ}+1+ivol) - (-2e^{-iJ}+1+ivol)\cdot F\right)$
$= (\lvert\alpha\rvert^2-\lvert\beta\rvert^2)(F_0+F_4)+(\alpha\bar\beta-\bar\alpha\beta)(F_2+F_6)$	$F = (\lvert\alpha\rvert^2-\lvert\beta\rvert^2)(F_1+F_5)+(\alpha\bar\beta-\bar\alpha\beta)(F_3)$

quations **for** pure spinors

$$\varepsilon^1 = a\,\theta_+ \otimes \eta_+ + c.c. \qquad \alpha \equiv a + ib$$
$$\varepsilon^2 = b\,\theta_+ \otimes \eta_+ + c.c. \qquad \beta \equiv a - ib$$

Pure spinors as bispinors

ierz rearrangement: $\eta_\pm \otimes \eta_+^\dagger = \frac{1}{4}\sum_{k=0}^{6} \frac{1}{k!}\eta_+^\dagger \gamma_{i_1\ldots i_k}\eta_\pm \gamma^{i_1\ldots i_k}$ ➡ $\eta_+ \otimes \eta_+^\dagger = e^{iJ}$, $\eta_+ \otimes \eta_-^\dagger = i\,\Omega$

d $e^{iJ} = \lambda^m D_m (\eta_+ \otimes \eta_+^\dagger)$. $\delta\psi_m = 0$ gives $D_m\eta = (H\,\Omega)\,\eta + (F\,\Omega)\,\eta + \ldots$ Using also dilatino eq we get

IIA	IIB
$e^{-f}d(e^f e^{iJ}) = \frac{Re(\alpha\bar\beta)}{\lvert\alpha\rvert^2+\lvert\beta\rvert^2} H \bullet e^{iJ}$	$e^{-f}d(e^f e^{iJ}) = \frac{Re(\alpha\bar\beta)}{\lvert\alpha\rvert^2+\lvert\beta\rvert^2} H \bullet e^{iJ} + F_B e^{iJ}$
$e^{-g}d(e^g\Omega) = \frac{\alpha^2+\beta^2}{2\alpha\beta} H \bullet \Omega + F_A e^{iJ}$	$e^{-g}d(e^g\Omega) = \frac{\alpha^2+\beta^2}{2\alpha\beta} H \bullet \Omega$
$e^{iJ} = -\frac{e^\phi}{16}\frac{1}{2\alpha\beta}\left(F\cdot(-\frac{1}{4}e^{-iJ}+1+ivol) - (-\frac{1}{4}e^{-iJ}+1+ivol)\cdot F^*\right)$	$F_B\, e^{iJ} = i\frac{e^\phi}{16}\frac{1}{\lvert\alpha\rvert^2+\lvert\beta\rvert^2}\left(F\cdot(-\frac{1}{4}e^{-iJ}+1+ivol) - (-2e^{-iJ}+1+ivol)\cdot F\right)$
$= (\lvert\alpha\rvert^2-\lvert\beta\rvert^2)(F_0+F_4)+(\alpha\bar\beta-\bar\alpha\beta)(F_2+F_6)$	$F = (\lvert\alpha\rvert^2-\lvert\beta\rvert^2)(F_1+F_5)+(\alpha\bar\beta-\bar\alpha\beta)(F_3)$

quations **for** pure spinors

$$\varepsilon^1 = a\,\theta_+ \otimes \eta_+ + c.c. \qquad \alpha \equiv a + ib$$
$$\varepsilon^2 = b\,\theta_+ \otimes \eta_+ + c.c. \qquad \beta \equiv a - ib$$

Pure spinors as bispinors

ierz rearrangement: $\eta_\pm \otimes \eta_+^\dagger = \frac{1}{4}\sum_{k=0}^{6}\frac{1}{k!}\eta_+^\dagger \gamma_{i_1\ldots i_k}\eta_\pm \gamma^{i_1\ldots i_k}$ ➡ $\eta_+ \otimes \eta_+^\dagger = e^{iJ}$, $\eta_+ \otimes \eta_-^\dagger = i\,\Omega$

d $e^{iJ} = \lambda^m D_m (\eta_+ \otimes \eta_+^\dagger)$. $\delta\psi_m = 0$ gives $D_m\eta = (H\,\Omega)\,\eta + (F\,\Omega)\,\eta + \ldots$ Using also dilatino eq we get

IIA	IIB
$e^{-f}d(e^f e^{iJ}) = \frac{Re(\alpha\bar\beta)}{\lvert\alpha\rvert^2+\lvert\beta\rvert^2} H \bullet e^{iJ}$	$e^{-f}d(e^f e^{iJ}) = \frac{Re(\alpha\bar\beta)}{\lvert\alpha\rvert^2+\lvert\beta\rvert^2} H \bullet e^{iJ} + F_B e^{iJ}$
$e^{-g}d(e^g\Omega) = \frac{\alpha^2+\beta^2}{2\alpha\beta} H \bullet \Omega + F_A e^{iJ}$	$e^{-g}d(e^g\Omega) = \frac{\alpha^2+\beta^2}{2\alpha\beta} H \bullet \Omega$
$e^{iJ} = -\frac{e^\phi}{16}\frac{1}{2\alpha\beta}\left(F\cdot(-\frac{1}{4}e^{-iJ}+1+ivol) - (-\frac{1}{4}e^{-iJ}+1+ivol)\cdot F^*\right)$	$F_B\, e^{iJ} = i\frac{e^\phi}{16}\frac{1}{\lvert\alpha\rvert^2+\lvert\beta\rvert^2}\left(F\cdot(-\frac{1}{4}e^{-iJ}+1+ivol) - (-2e^{-iJ}+1+ivol)\cdot F\right)$
$= (\lvert\alpha\rvert^2-\lvert\beta\rvert^2)(F_0+F_4)+(\alpha\bar\beta-\bar\alpha\beta)(F_2+F_6)$	$F = (\lvert\alpha\rvert^2-\lvert\beta\rvert^2)(F_1+F_5)+(\alpha\bar\beta-\bar\alpha\beta)(F_3)$

$$f = 2A - \phi + log(|\alpha|^2 + |\beta|^2) \qquad g = 2A - \phi + log(\alpha\beta)$$

Internal gravitino as equations for two pure spinors

Modulo α's and β's

IIA

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega + F_A e^{iJ}$$

IIB

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ} + F_B e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega$$

Internal gravitino as equations for two pure spinors

Modulo α's and β's

IIA

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega + F_A e^{iJ}$$

↓

$e^f e^{iJ}$ is "twisted" closed

IIB

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ} + F_B e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega$$

Internal gravitino as equations for two pure spinors

Modulo α's and β's

IIA

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega + F_A e^{iJ}$$

$\downarrow$

$e^f e^{iJ}$ is "twisted" closed

IIB

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ} + F_B e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega$$

$\downarrow$

$e^g \Omega$ is "twisted" closed

Internal gravitino as equations for two pure spinors

Modulo α's and β's

IIA	IIB
$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ}$	$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ} + F_B\, e^{iJ}$
$e^{-g} d(e^g \Omega) = H \bullet \Omega + F_A\, e^{iJ}$	$e^{-g} d(e^g \Omega) = H \bullet \Omega$
$\downarrow$	$\downarrow$
$e^f e^{iJ}$ is "twisted" closed	$e^g\, \Omega$ is "twisted" closed

mirror symmetry $\longleftrightarrow$

Internal gravitino as equations for two pure spinors

Modulo α's and β's

IIA	IIB
$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ}$	$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ} + F_B\, e^{iJ}$
$e^{-g} d(e^g \Omega) = H \bullet \Omega + F_A\, e^{iJ}$	$e^{-g} d(e^g \Omega) = H \bullet \Omega$
$\downarrow$	$\downarrow$
$e^f e^{iJ}$ is "twisted" closed	$e^g\, \Omega$ is "twisted" closed

mirror symmetry

Sugra "twisting": $\left[d - H_{mnp}\left(dx^m \wedge dx^n \iota^p - \frac{1}{3}\iota^m \iota^n \iota^p\right)\right](e^f \varphi) = 0$

$H\bullet$

$\varphi = e^{iJ}$ in IIA

$\varphi = \Omega$ in IIB

Internal gravitino as equations for two pure spinors

Modulo α's and β's

IIA

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega + F_A e^{iJ}$$

IIB

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ} + F_B e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega$$

$e^f e^{iJ}$ is "twisted" closed $\longleftrightarrow$ (mirror symmetry) $e^g \Omega$ is "twisted" closed

Sugra "twisting": $\left[d - H_{mnp}\left(dx^m \wedge dx^n \iota^p - \frac{1}{3}\iota^m \iota^n \iota^p\right)\right](e^f \varphi) = 0$

$\varphi = e^{iJ}$ in IIA

$\varphi = \Omega$ in IIB

$$H\bullet$$

ferent than usual twisting!

altieri $[d \quad]\varphi = 0$

Internal gravitino as equations for two pure spinors

Modulo α's and β's

IIA

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega + F_A e^{iJ}$$

IIB

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ} + F_B e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega$$

$e^f e^{iJ}$ is "twisted" closed $\longleftrightarrow$ (mirror symmetry) $e^g \Omega$ is "twisted" closed

Sugra "twisting": $\left[d - H_{mnp}\left(dx^m \wedge dx^n \iota^p - \frac{1}{3}\iota^m \iota^n \iota^p\right)\right](e^f \varphi) = 0$

$\varphi = e^{iJ}$ in IIA

$\varphi = \Omega$ in IIB

$$\rightarrow H\bullet$$

ferent than usual twisting!

altieri $[d \quad]\varphi = 0 \rightarrow$ Associated GACS integrable: $\Pi_{\mp}[\Pi_{\pm}, \Pi_{\pm}]_C = 0$

Internal gravitino as equations for two pure spinors

Modulo α's and β's

IIA

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega + F_A e^{iJ}$$

IIB

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ} + F_B e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega$$

$e^f e^{iJ}$ is "twisted" closed $\longleftrightarrow$ (mirror symmetry) $e^g \Omega$ is "twisted" closed

Sugra "twisting": $\left[d - H_{mnp}\left(dx^m \wedge dx^n \iota^p - \frac{1}{3}\iota^m \iota^n \iota^p\right)\right](e^f \varphi) = 0$

$\varphi = e^{iJ}$ in IIA

$\varphi = \Omega$ in IIB

$H\bullet$

ferent than usual twisting!

altieri's twisting $[d + H\wedge\ ]\varphi = 0$ → Associated GACS integrable: $\Pi_{\mp}[\Pi_{\pm}, \Pi_{\pm}]_C = 0$

Internal gravitino as equations for two pure spinors

Modulo α's and β's

IIA

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega + F_A e^{iJ}$$

IIB

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ} + F_B e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega$$

$e^f e^{iJ}$ is "twisted" closed $\longleftrightarrow$ (mirror symmetry) $e^g \Omega$ is "twisted" closed

Sugra "twisting": $\left[d - H_{mnp}\left(dx^m \wedge dx^n \iota^p - \frac{1}{3}\iota^m \iota^n \iota^p\right)\right](e^f \varphi) = 0$

$\varphi = e^{iJ}$ in IIA

$\varphi = \Omega$ in IIB

$H\bullet$

ferent than usual twisting!

altieri's twisting $[d + H\wedge\ ]\varphi = 0$ → Associated GACS integrable with $[\ ,\ ]_C \to [\ ,\ ]_H$

Internal gravitino as equations for two pure spinors

Modulo α's and β's

IIA

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega + F_A e^{iJ}$$

IIB

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ} + F_B e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega$$

$e^f e^{iJ}$ is "twisted" closed $\longleftrightarrow$ (mirror symmetry) $e^g \Omega$ is "twisted" closed

Sugra "twisting": $\left[d - H_{mnp}\left(dx^m \wedge dx^n \iota^p - \frac{1}{3}\iota^m \iota^n \iota^p\right)\right](e^f \varphi) = 0$

$H\bullet$

$\varphi = e^{iJ}$ in IIA

$\varphi = \Omega$ in IIB

ferent than usual twisting!

altieri's twisting $[d + H\wedge\ ]\varphi = 0$ → Associated GACS integrable with $[\ ,\ ]_C \to [\ ,\ ]_H$

$$[X+\zeta, Y+\eta]_H = [X+\zeta, Y+\eta]_C + \iota_X \iota_Y H$$

Internal gravitino as equations for two pure spinors

Modulo α's and β's

IIA

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega + F_A e^{iJ}$$

IIB

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ} + F_B e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega$$

$e^f e^{iJ}$ is "twisted" closed $\longleftrightarrow$ (mirror symmetry) $e^g \Omega$ is "twisted" closed

Sugra "twisting": $\left[d - H_{mnp}\left(dx^m \wedge dx^n \iota^p - \frac{1}{3}\iota^m \iota^n \iota^p\right)\right](e^f \varphi) = 0$

$\varphi = e^{iJ}$ in IIA

$\varphi = \Omega$ in IIB

$$H\bullet$$

ferent than usual twisting!

altieri's twisting $[d + H\wedge\ ]\varphi = 0$ → Associated GACS integrable with $[\ ,\ ]_C \to [\ ,\ ]_H$

$$[X+\zeta, Y+\eta]_H = [X+\zeta, Y+\eta]_C + \iota_X \iota_Y H$$

Twisting by H in supergravity equations does not work à la Hitchin-Gualtieri

Internal gravitino as equations for two pure spinors

Modulo α's and β's

IIA

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega + F_A e^{iJ}$$

IIB

$$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ} + F_B e^{iJ}$$

$$e^{-g} d(e^g \Omega) = H \bullet \Omega$$

$e^f e^{iJ}$ is "twisted" closed $\longleftrightarrow$ (mirror symmetry) $e^g \Omega$ is "twisted" closed

$\mathcal{M}$ is twisted symplectic

Sugra "twisting": $\left[d - H_{mnp}\left(dx^m \wedge dx^n \iota^p - \frac{1}{3}\iota^m \iota^n \iota^p\right)\right](e^f \varphi) = 0$

$\varphi = e^{iJ}$ in IIA

$\varphi = \Omega$ in IIB

$$H\bullet$$

ferent than usual twisting!

altieri's twisting $[d + H\wedge\ ]\varphi = 0$ → Associated GACS integrable with $[\ ,\ ]_C \to [\ ,\ ]_H$

$$[X+\zeta, Y+\eta]_H = [X+\zeta, Y+\eta]_C + \iota_X \iota_Y H$$

Twisting by H in supergravity equations does not work à la Hitchin-Gualtieri

Internal gravitino as equations for two pure spinors

Modulo α's and β's

IIA	IIB
$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ}$	$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ} + F_B\, e^{iJ}$
$e^{-g} d(e^g \Omega) = H \bullet \Omega + F_A\, e^{iJ}$	$e^{-g} d(e^g \Omega) = H \bullet \Omega$
$\downarrow$	$\downarrow$
$e^f e^{iJ}$ is "twisted" closed	$e^g\, \Omega$ is "twisted" closed
$\mathcal{M}$ is twisted symplectic	$\mathcal{M}$ is complex

mirror symmetry

Sugra "twisting": $\left[d - H_{mnp}\left(dx^m \wedge dx^n \iota^p - \frac{1}{3}\iota^m \iota^n \iota^p\right)\right](e^f \varphi) = 0$

$\varphi = e^{iJ}$ in IIA

$\varphi = \Omega$ in IIB

$\downarrow$

$H\bullet$

ferent than usual twisting!

altieri's twisting $[d + H\wedge\ ]\varphi = 0$ → Associated GACS integrable with $[\ ,\ ]_C \to [\ ,\ ]_H$

$$[X+\zeta, Y+\eta]_H = [X+\zeta, Y+\eta]_C + \iota_X \iota_Y H$$

Twisting by H in supergravity equations does not work à la Hitchin-Gualtieri

Internal gravitino as equations for two pure spinors

Modulo α's and β's

IIA	IIB
$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ}$	$e^{-f} d(e^f e^{iJ}) = H \bullet e^{iJ} + F_B\, e^{iJ}$
$e^{-g} d(e^g \Omega) = H \bullet \Omega + F_A\, e^{iJ}$	$e^{-g} d(e^g \Omega) = H \bullet \Omega$
$\downarrow$	$\downarrow$
$e^f e^{iJ}$ is "twisted" closed	$e^g\, \Omega$ is "twisted" closed
$\mathcal{M}$ is twisted symplectic	$\mathcal{M}$ is complex

mirror symmetry

(no (2,2) piece in $H \bullet \Omega$)
H does not "twist" the complex structure

Sugra "twisting": $\left[d - H_{mnp}\left(dx^m \wedge dx^n \iota^p - \frac{1}{3}\iota^m \iota^n \iota^p\right)\right](e^f \varphi) = 0$

$\varphi = e^{iJ}$ in IIA

$\varphi = \Omega$ in IIB

$\downarrow$

$H\bullet$

ferent than usual twisting!

altieri's twisting $[d + H\wedge\ ]\varphi = 0$ → Associated GACS integrable with $[\ ,\ ]_C \to [\ ,\ ]_H$

$$[X+\zeta, Y+\eta]_H = [X+\zeta, Y+\eta]_C + \iota_X \iota_Y H$$

Twisting by H in supergravity equations does not work à la Hitchin-Gualtieri

What is the meaning of supergravity twisting by H?

Still don't know…

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:
  $A, B \in T \oplus T^*$: $[A , B]_C = [[d , A] , B] - A \leftrightarrow B$

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:
  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:
  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:
  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:
  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$
- Action of b-field is adjoint action

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

  $e^b \cdot (X+\zeta) = X+\zeta + i_X b \leftrightarrow e^b (X+\zeta) e^{-b}$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

  $e^b \cdot (X+\zeta) = X+\zeta + i_X b \leftrightarrow e^b (X+\zeta) e^{-b}$

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - \; A \leftrightarrow B$$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - \; A \leftrightarrow B$$

$$= e^b [[e^{-b} d e^b , A] , B] e^{-b} - \; A \leftrightarrow B$$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - A \leftrightarrow B$$

$$= e^b [[e^{-b} d e^b , A] , B] e^{-b} - A \leftrightarrow B$$

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B$$

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B$$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B$$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - \; A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - \; A \leftrightarrow B$$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - \; A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - \; A \leftrightarrow B \; = e^b \cdot [A , B]_{\text{H-Courant}}$$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - \; A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - \; A \leftrightarrow B \; = e^b \cdot [A , B]_{\text{H-Courant}}$$

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - \; A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - \; A \leftrightarrow B \; = e^b \cdot [A , B]_{\text{H-Courant}}$$

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - \; A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - \; A \leftrightarrow B \; = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - \; A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - \; A \leftrightarrow B \; = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - \; A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - \; A \leftrightarrow B \; = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\Lambda} d e^{-\Lambda} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\Lambda} d e^{-\Lambda} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\Lambda} d e^{-\Lambda} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\Lambda} d e^{-\Lambda} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\Lambda} d e^{-\Lambda} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\Lambda} d e^{-\Lambda} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\Lambda} d e^{-\Lambda} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\wedge} d e^{-\wedge} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\wedge} d e^{-\wedge} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ $\rightarrow$ usual twisting

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\Lambda} d e^{-\Lambda} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ $\rightarrow$ usual twisting

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\wedge} d e^{-\wedge} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ $\rightarrow$ usual twisting

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\Lambda} d e^{-\Lambda} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ → usual twisting

- Unsuccesfully tried to understand supergravity twisting in different ways…

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\Lambda} d e^{-\Lambda} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ → usual twisting

- Unsuccesfully tried to understand supergravity twisting in different ways…

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\Lambda} d e^{-\Lambda} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ → usual twisting

- Unsuccesfully tried to understand supergravity twisting in different ways…

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\Lambda} d e^{-\Lambda} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ → usual twisting

- Unsuccesfully tried to understand supergravity twisting in different ways...

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\Lambda} d e^{-\Lambda} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ → usual twisting

- Unsuccesfully tried to understand supergravity twisting in different ways...

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\Lambda} d e^{-\Lambda} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ → usual twisting

- Unsuccesfully tried to understand supergravity twisting in different ways...

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\wedge} d e^{-\wedge} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ → usual twisting

- Unsuccesfully tried to understand supergravity twisting in different ways…

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\wedge} d e^{-\wedge} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ → usual twisting

- Unsuccesfully tried to understand supergravity twisting in different ways…

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\Lambda} d e^{-\Lambda} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ → usual twisting

- Unsuccesfully tried to understand supergravity twisting in different ways...

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - \; A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - \; A \leftrightarrow B \; = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\wedge} d e^{-\wedge} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ → usual twisting

- Unsuccesfully tried to understand supergravity twisting in different ways…

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\Lambda} d e^{-\Lambda} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ → usual twisting

- Unsuccesfully tried to understand supergravity twisting in different ways…

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\Lambda} d e^{-\Lambda} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ → usual twisting

- Unsuccesfully tried to understand supergravity twisting in different ways…

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\wedge} d e^{-\wedge} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ → usual twisting

- Unsuccesfully tried to understand supergravity twisting in different ways...

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\Lambda} d e^{-\Lambda} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ → usual twisting

- Unsuccesfully tried to understand supergravity twisting in different ways...

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\Lambda} d e^{-\Lambda} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ → usual twisting

- Unsuccesfully tried to understand supergravity twisting in different ways...

What is the meaning of supergravity twisting by H?

Still don't know…

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\wedge} d e^{-\wedge} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ → usual twisting

- Unsuccesfully tried to understand supergravity twisting in different ways…

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\wedge} d e^{-\wedge} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ → usual twisting

- Unsuccesfully tried to understand supergravity twisting in different ways...

What is the meaning of supergravity twisting by H?

Still don't know...

Is it possible to twist the Courant bracket in a different way than $H\wedge$?

- Courant bracket is a derived bracket:

  $A, B \in T \oplus T^* : [A , B]_C = [[d , A] , B] - A \leftrightarrow B$

- Action of b-field is adjoint action

$$e^b \cdot (X+\zeta) = X+\zeta + i_X b \;\leftrightarrow\; e^b (X+\zeta) e^{-b}$$

$$e^b A e^{-b} = A + [b , A] + \tfrac{1}{2} [b , [b , A]] + \ldots$$

$$[e^b \cdot A , e^b \cdot B]_C = [[d, e^b A e^{-b}] , e^b B e^{-b}] \; - A \leftrightarrow B$$

$$= e^b [[\underbrace{e^{-b} d e^b}_{d + H\wedge} , A] , B] e^{-b} - A \leftrightarrow B = e^b \cdot [A , B]_{\text{H-Courant}}$$

- Can we have adjoint action of more general two-index operator?

$$\Lambda \equiv b_{mn}\lambda^{mn} + c_m{}^n[\lambda^m, \iota_n] + d^{mn}\iota_{mn}$$

Imposing $e^{\wedge} d e^{-\wedge} = d + \partial(b, c, d)\lambda^{\cdot\cdot}\iota_{\cdot\cdot}$ enforces $\Lambda = b_{mn}\lambda^{mn}$ $\rightarrow$ usual twisting

- Unsuccesfully tried to understand supergravity twisting in different ways...

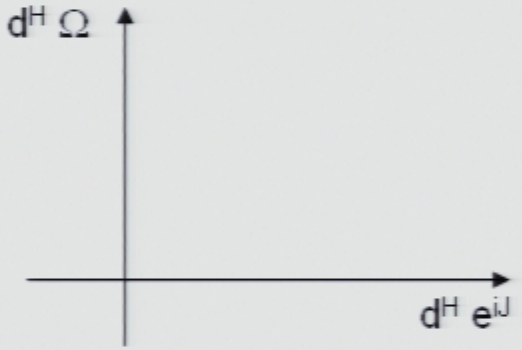
IIA		IIB
$e^f e^{iJ}$ is "twisted" closed	mirror symmetry $\longleftrightarrow$	$e^g \Omega$ is "twisted" closed
$\mathcal{M}$ is twisted symplectic		$\mathcal{M}$ is complex

IIA		IIB
$e^f e^{iJ}$ is "twisted" closed	mirror symmetry $\longleftrightarrow$	$e^g \Omega$ is "twisted" closed
$\mathcal{M}$ is twisted symplectic		$\mathcal{M}$ is complex

Susy vacua are all "twisted" generalized Calabi-Yau's !

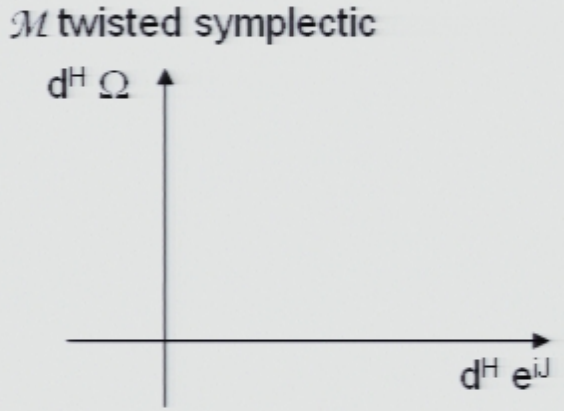
IIA		IIB
$e^f e^{iJ}$ is "twisted" closed	mirror symmetry $\longleftrightarrow$	$e^g \Omega$ is "twisted" closed
$\mathcal{M}$ is twisted symplectic		$\mathcal{M}$ is complex

Susy vacua are all "twisted" generalized Calabi-Yau's !



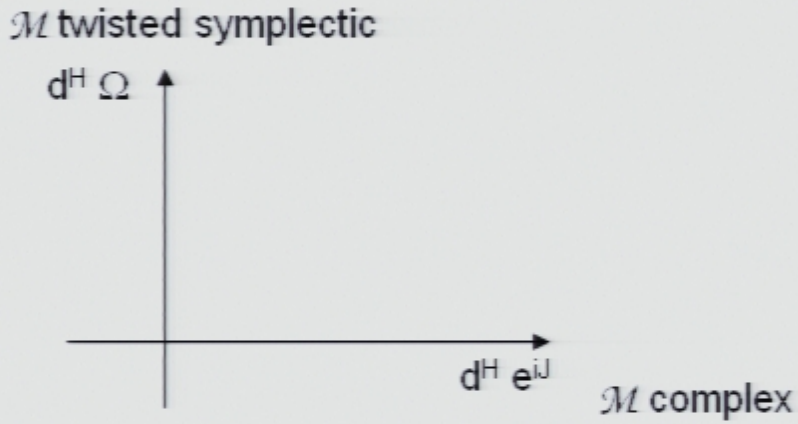
IIA		IIB
$e^f e^{iJ}$ is "twisted" closed	mirror symmetry $\longleftrightarrow$	$e^g \Omega$ is "twisted" closed
$\mathcal{M}$ is twisted symplectic		$\mathcal{M}$ is complex

Susy vacua are all "twisted" generalized Calabi-Yau's !



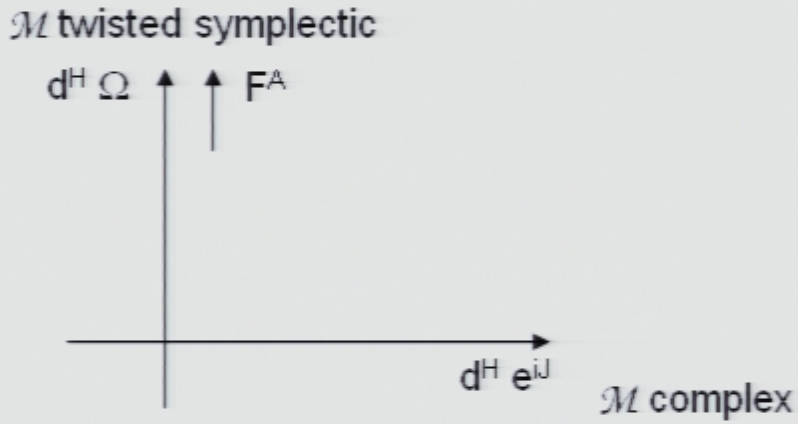
IIA		IIB
$e^f e^{iJ}$ is "twisted" closed	mirror symmetry $\longleftrightarrow$	$e^g \Omega$ is "twisted" closed
$\mathcal{M}$ is twisted symplectic		$\mathcal{M}$ is complex

Susy vacua are all "twisted" generalized Calabi-Yau's !



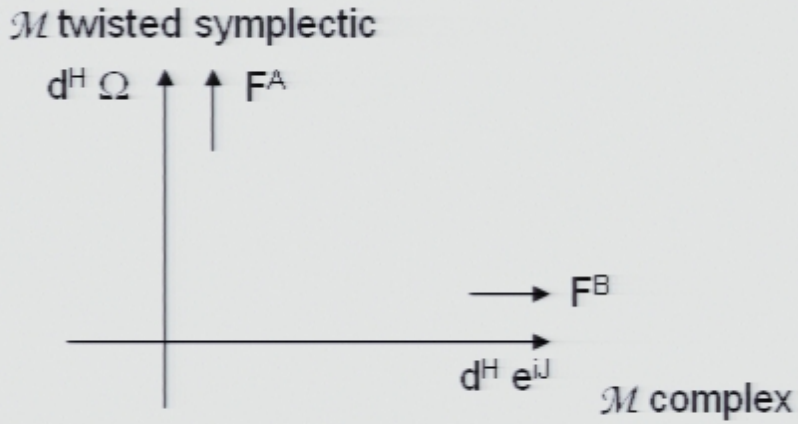
IIA		IIB
$e^f e^{iJ}$ is "twisted" closed	mirror symmetry $\longleftrightarrow$	$e^g \Omega$ is "twisted" closed
$\mathcal{M}$ is twisted symplectic		$\mathcal{M}$ is complex

Susy vacua are all "twisted" generalized Calabi-Yau's !



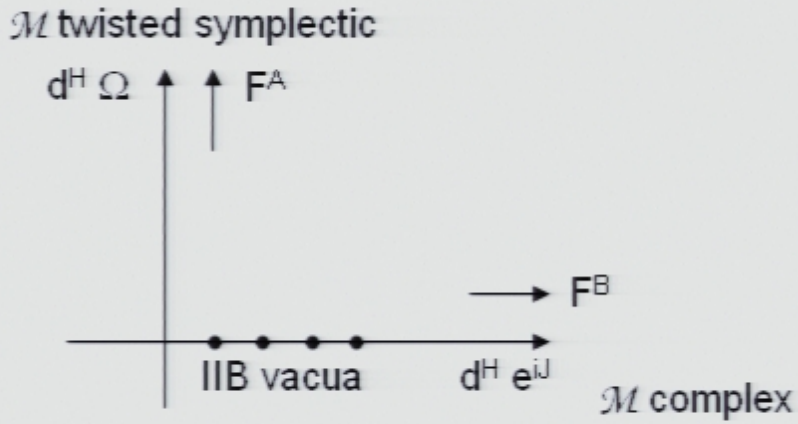
IIA		IIB
$e^f e^{iJ}$ is "twisted" closed	mirror symmetry $\longleftrightarrow$	$e^g \Omega$ is "twisted" closed
$\mathcal{M}$ is twisted symplectic		$\mathcal{M}$ is complex

Susy vacua are all "twisted" generalized Calabi-Yau's !



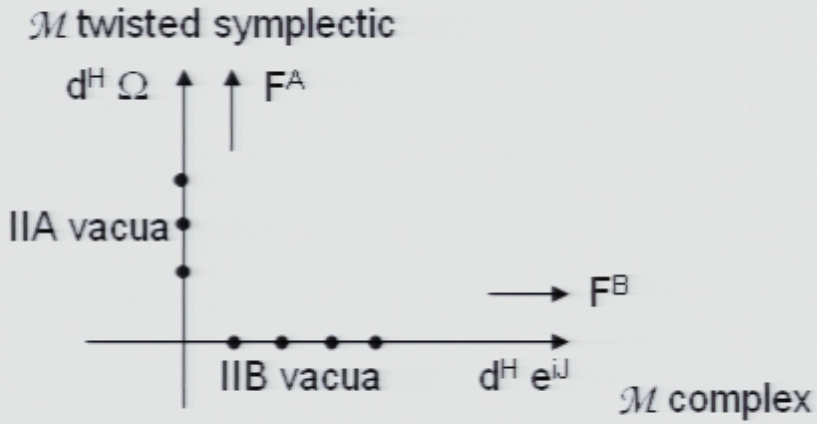
IIA		IIB
$e^f e^{iJ}$ is "twisted" closed	mirror symmetry $\longleftrightarrow$	$e^g \Omega$ is "twisted" closed
$\mathcal{M}$ is twisted symplectic		$\mathcal{M}$ is complex

Susy vacua are all "twisted" generalized Calabi-Yau's !



IIA		IIB
$e^f e^{iJ}$ is "twisted" closed	mirror symmetry	$e^g \Omega$ is "twisted" closed
$\mathcal{M}$ is twisted symplectic		$\mathcal{M}$ is complex

Susy vacua are all "twisted" generalized Calabi-Yau's !



IIA		IIB
$e^f e^{iJ}$ is "twisted" closed	mirror symmetry	$e^g \Omega$ is "twisted" closed
$\mathcal{M}$ is twisted symplectic		$\mathcal{M}$ is complex

Susy vacua are all "twisted" generalized Calabi-Yau's !

