

Title: Quantum Fields in a Shape Dynamics Background

Date: Jun 26, 2015 11:00 AM

URL: <http://pirsa.org/15060031>

Abstract:

Example: Free scalar field theory ($p = 0, q = \frac{1}{2} + i\nu$)

Hilbert space

- $C(3)$ -invariant vacuum $|0\rangle$
- Fock creation operators $a^\dagger(j_1 m_1, j_2 m_2)$
- Casimir Q_2 can be solved for D
 - $\Rightarrow D = \sqrt{J^2 + 2(P.S + S.P) + (9/4 + \nu^2)\mathbb{I}}$
 - \Rightarrow quadratic Hamiltonian:

$$H = \sum_{j_1 m_1 j_2 m_2, j'_1 m'_1 j'_2 m'_2} a^\dagger_{j_1 m_1 j_2 m_2} D_{j'_1 m'_1 j'_2 m'_2}^{j_1 m_1 j_2 m_2} a_{j'_1 m'_1 j'_2 m'_2}$$

Important: The modes are localized on \mathbb{R}^3 , not on deSitter

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QFT on SD background

