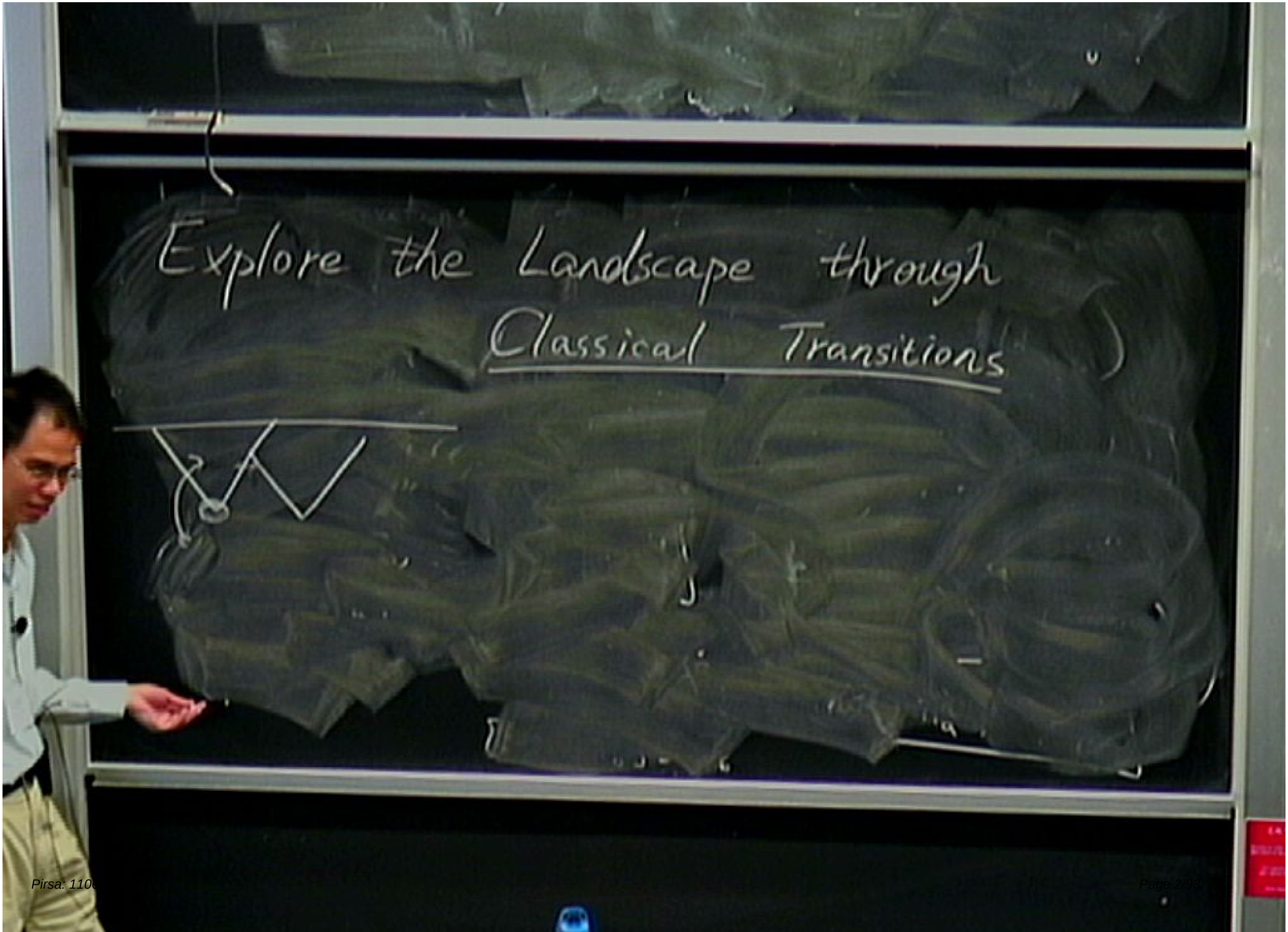
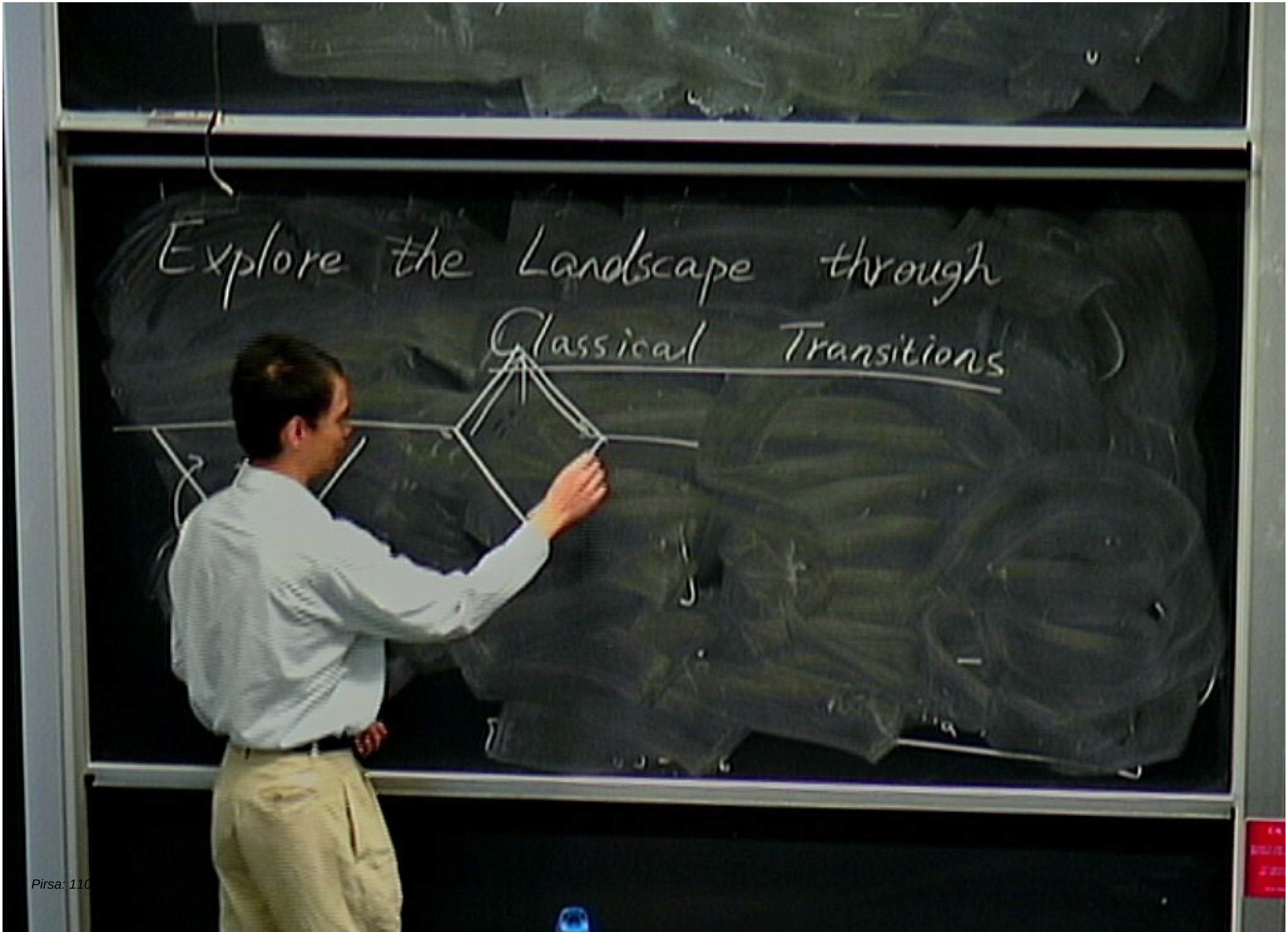
Title: Exploring the Landscape with Classical Transitions

Date: Jun 22, 2011 03:50 PM

URL: http://pirsa.org/11060064

Abstract: Classical transition is one of the simplest consequences of cosmic bubble collisions. In quite a few simple toy model landscapes, collisions always result in classical transitions. Can it be generalized to the "real" string theory landscape? If so, does it imply some sort of hidden structure of the landscape?


Explore the Landscape through
Classical Transitions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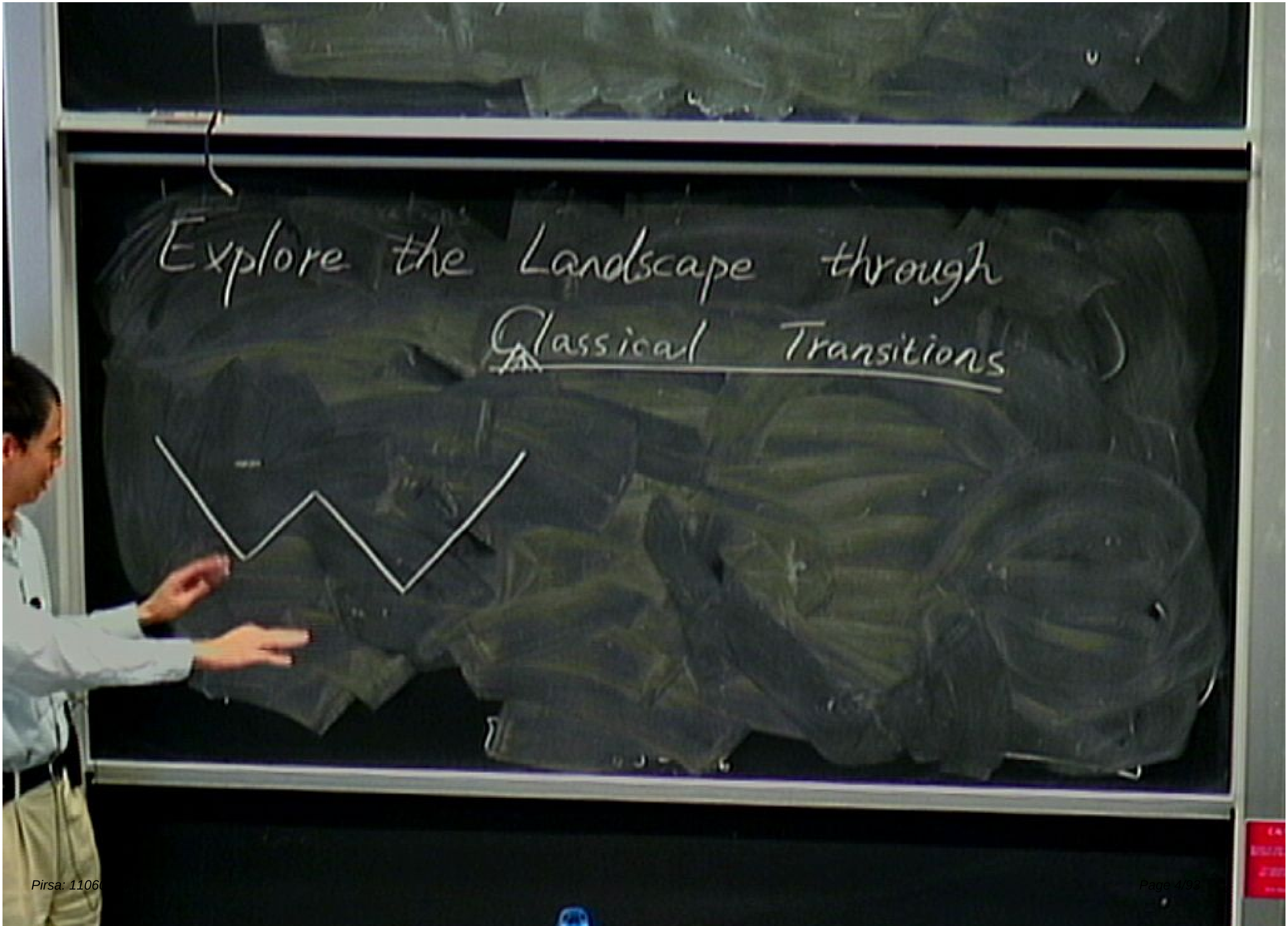
Classical Transitions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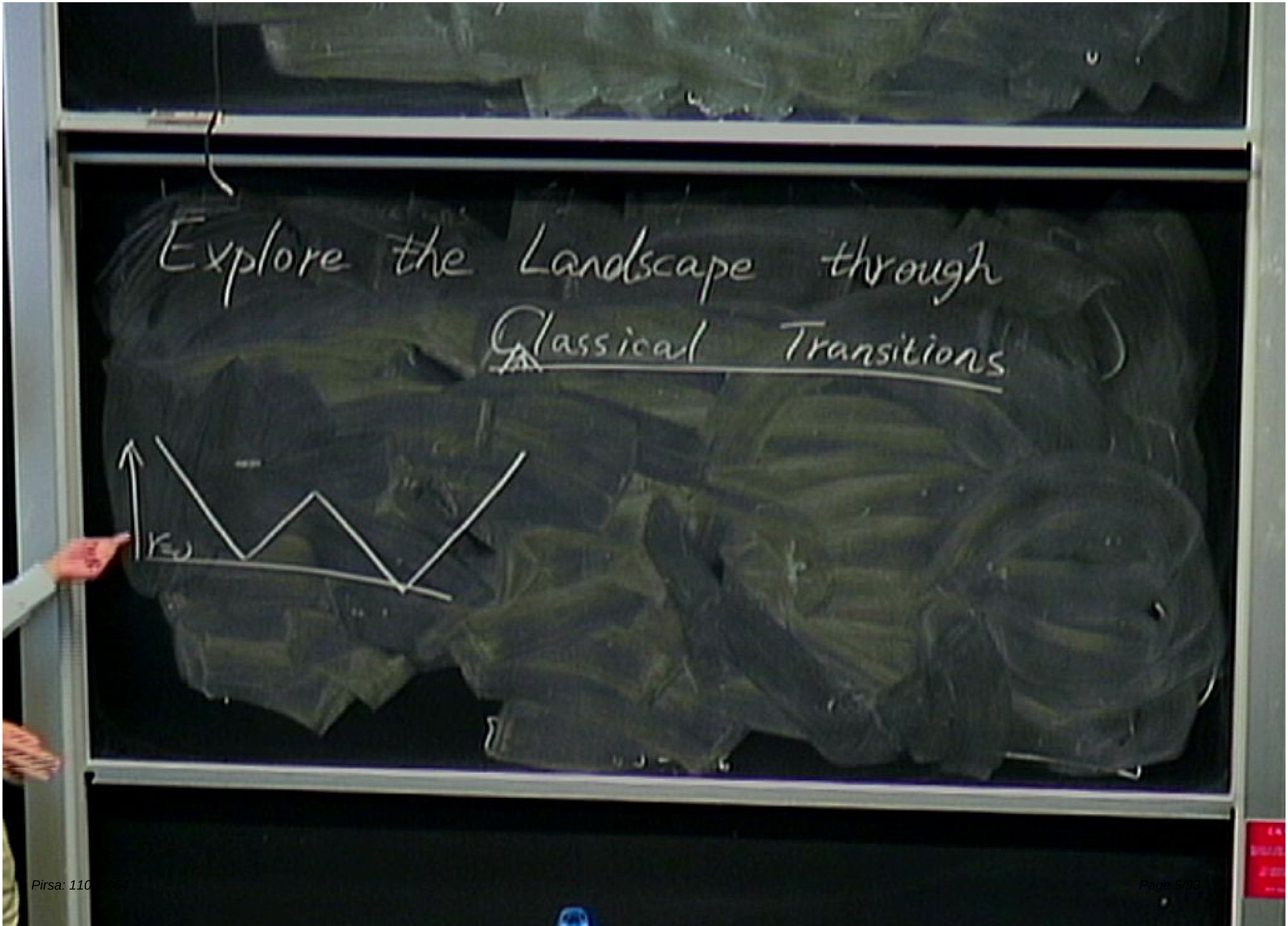
Classical Transitions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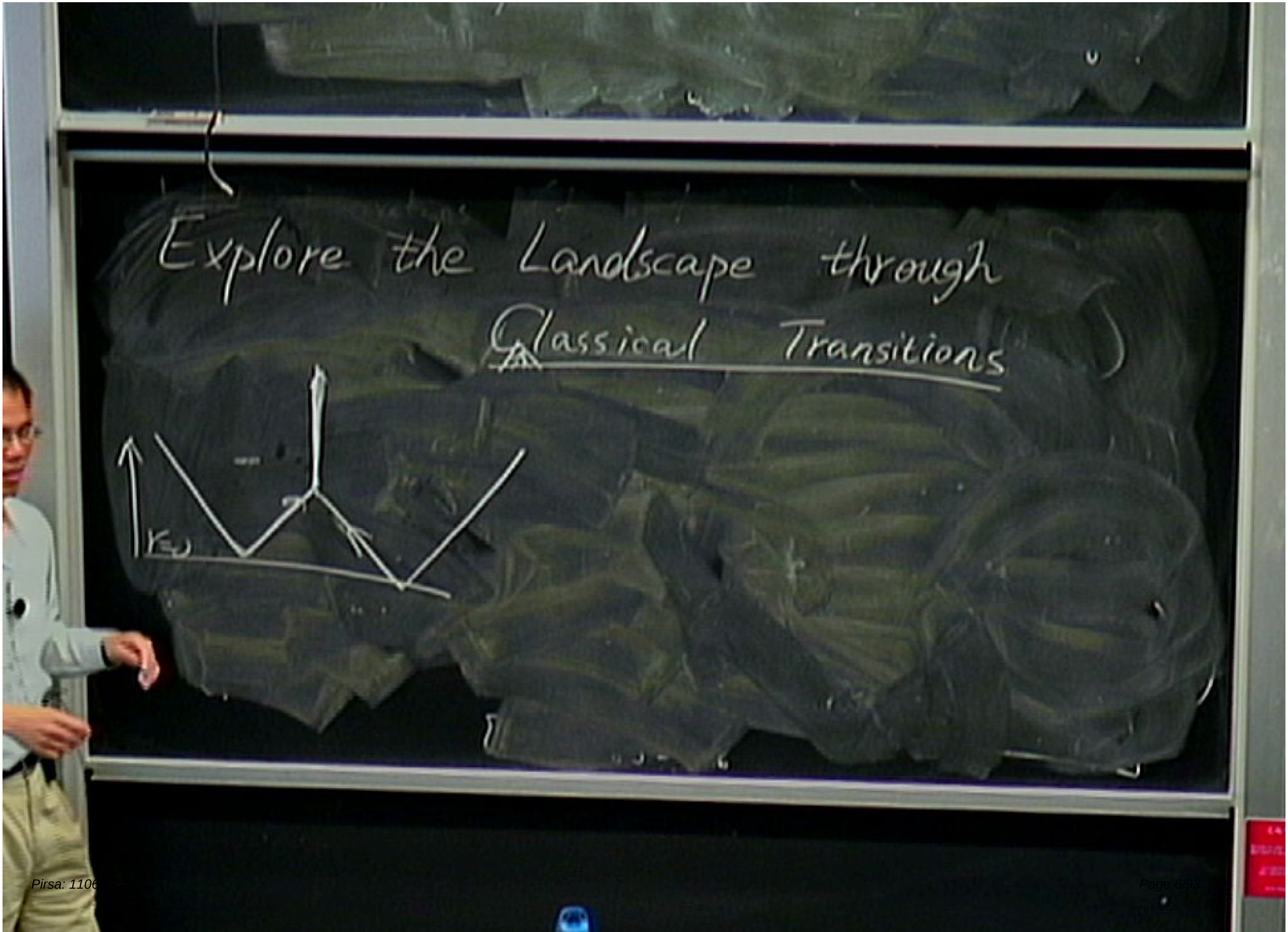
Classical Transitions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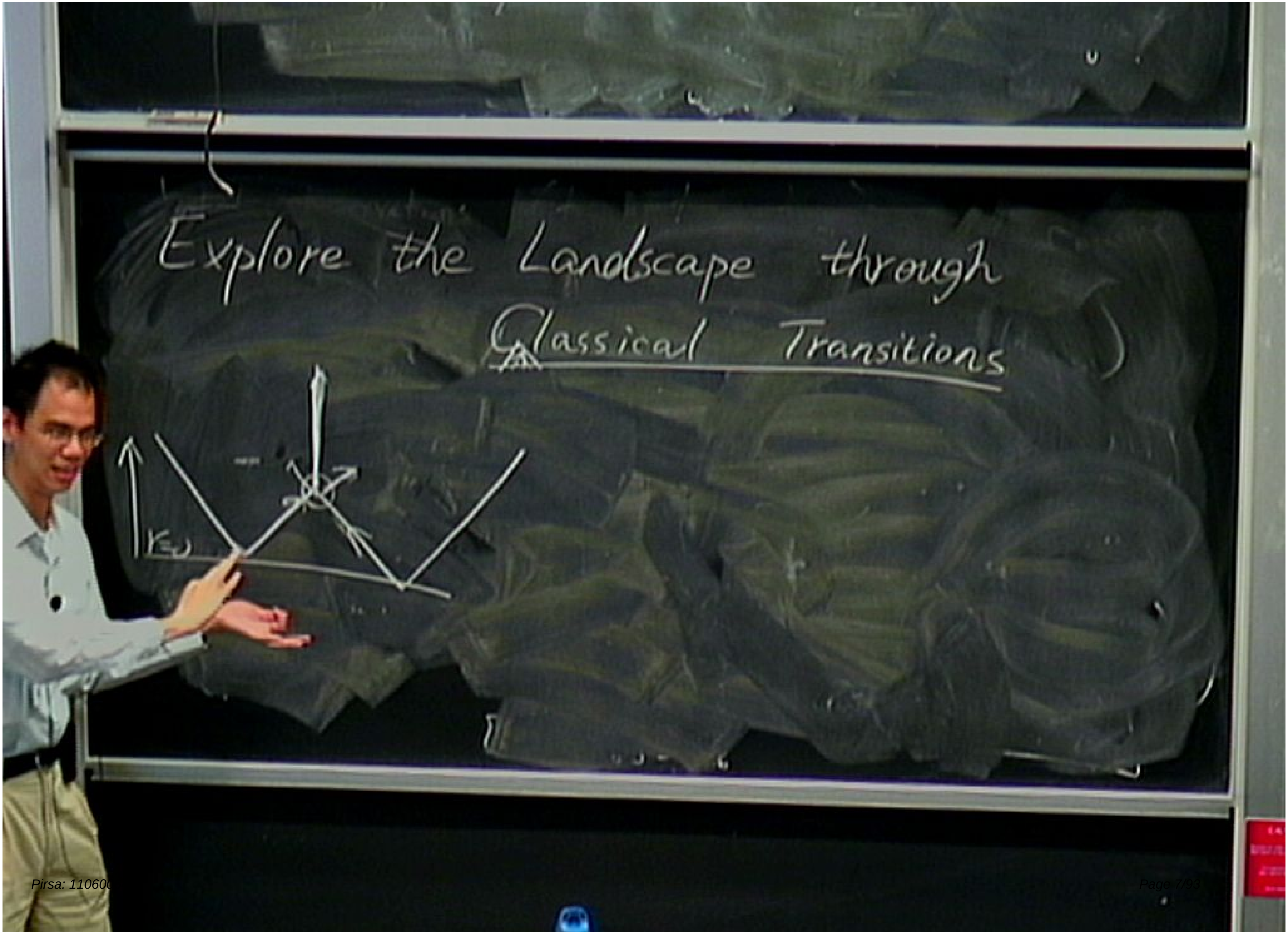
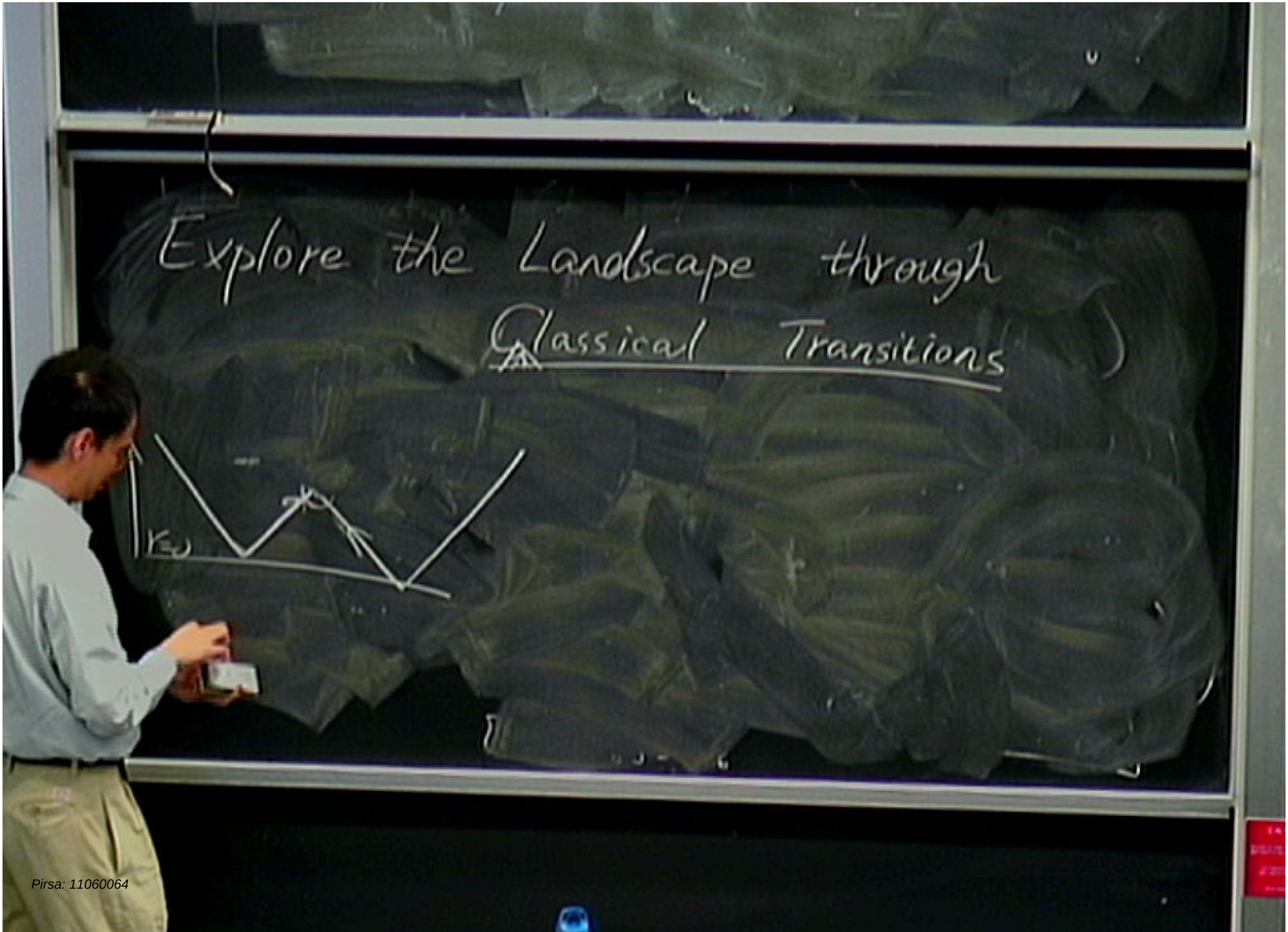
Classical Transitions


Explore the Landscape through
Classical Transitions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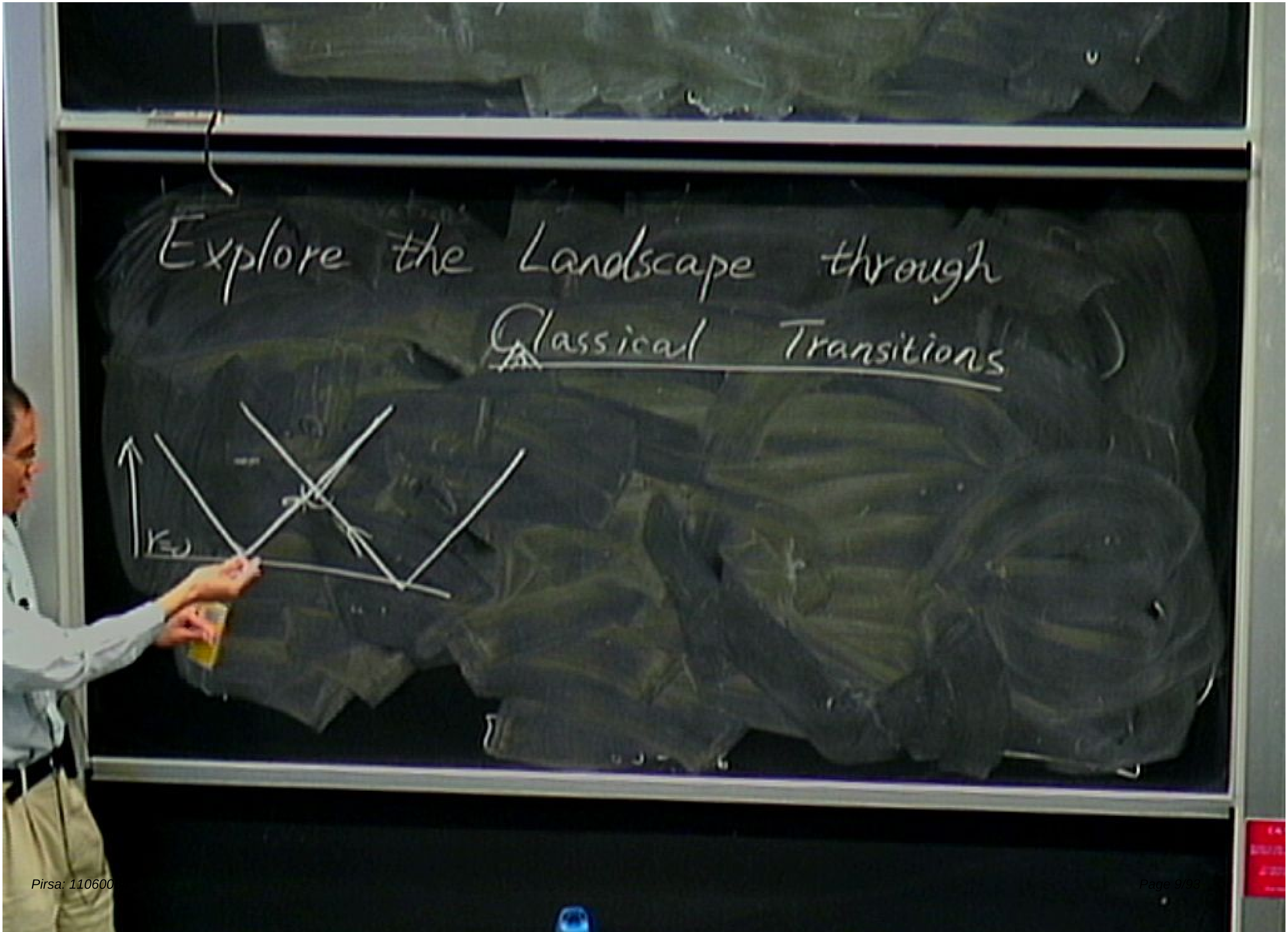
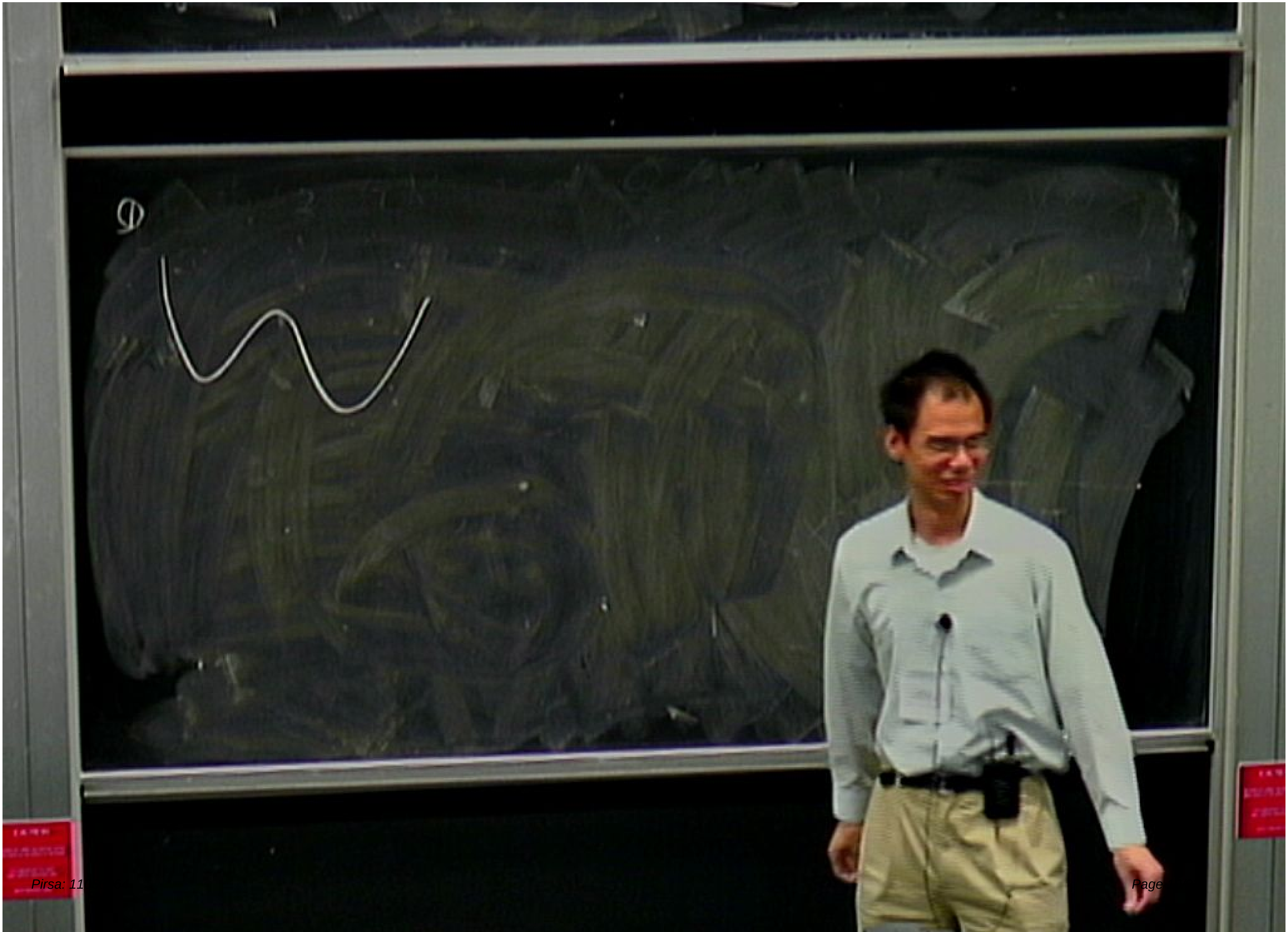
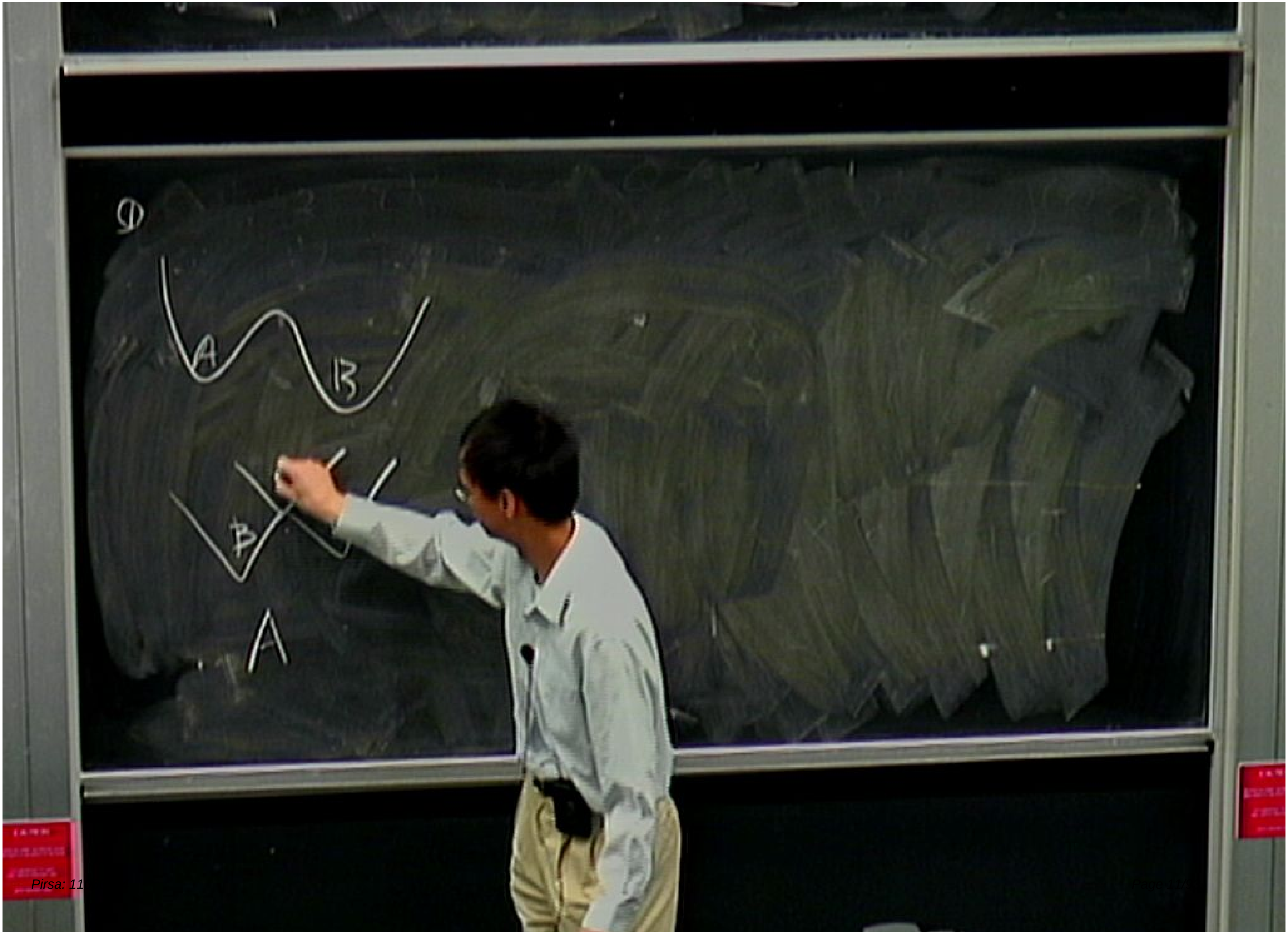
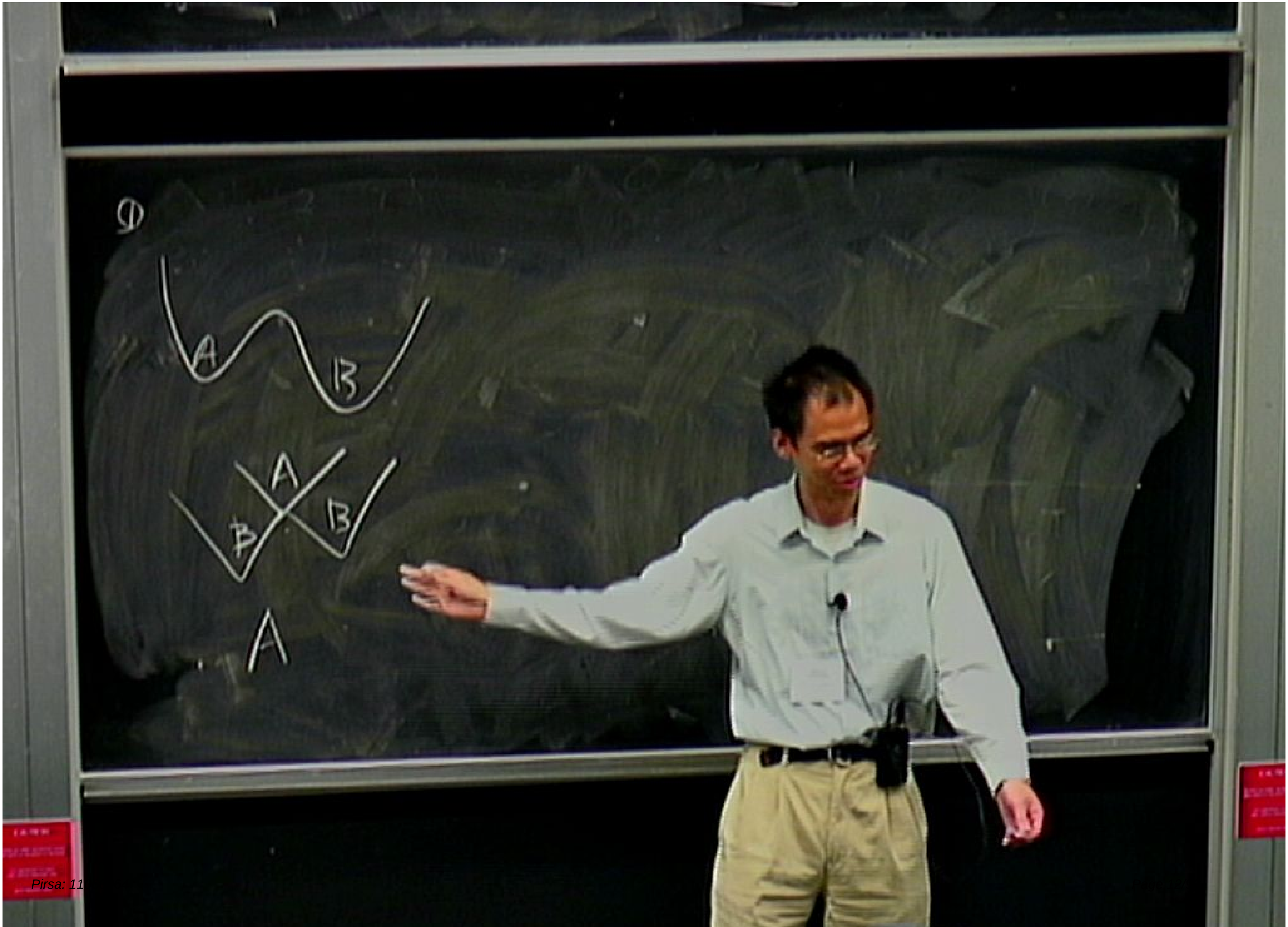
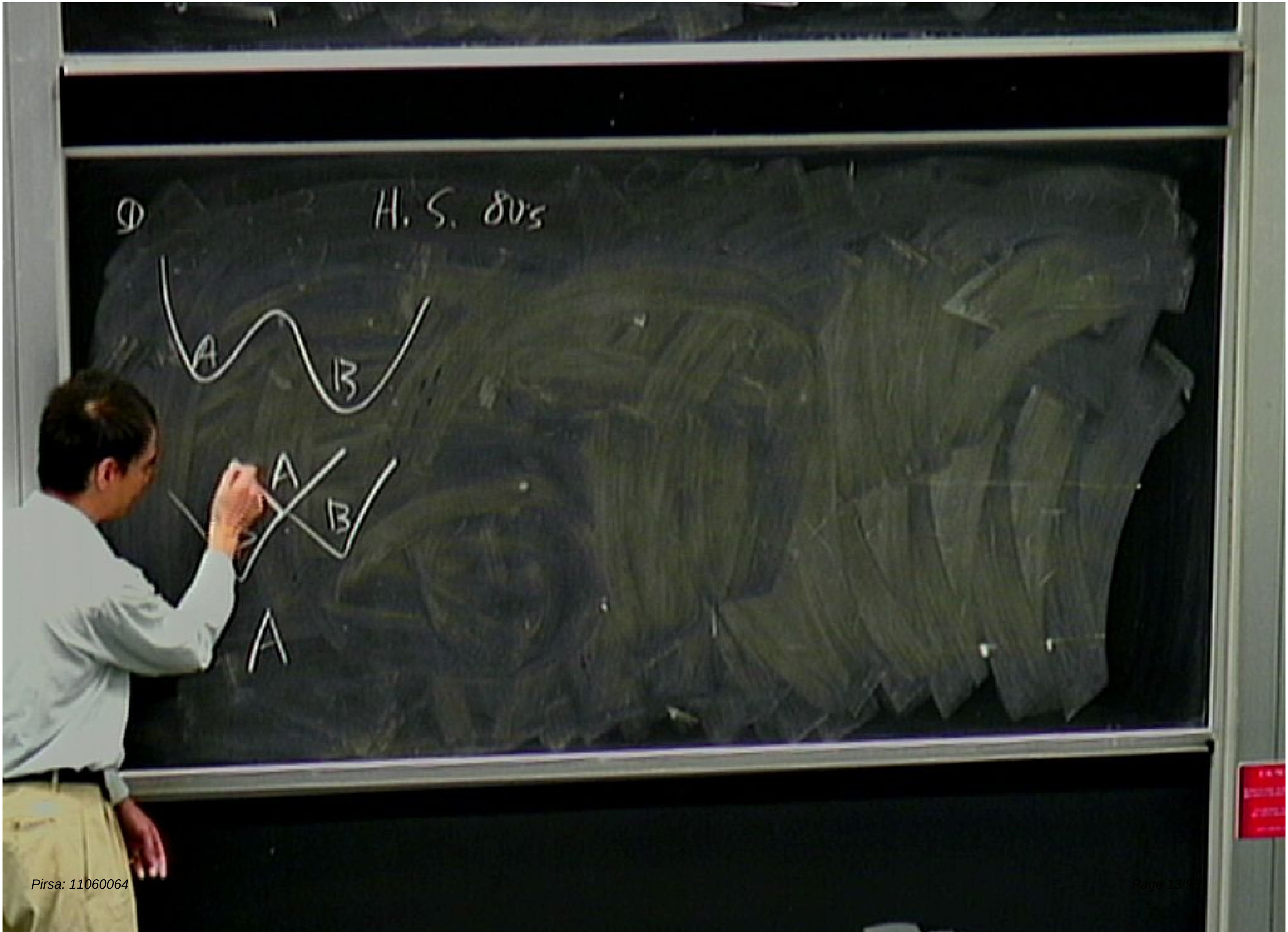
Classical Transitions

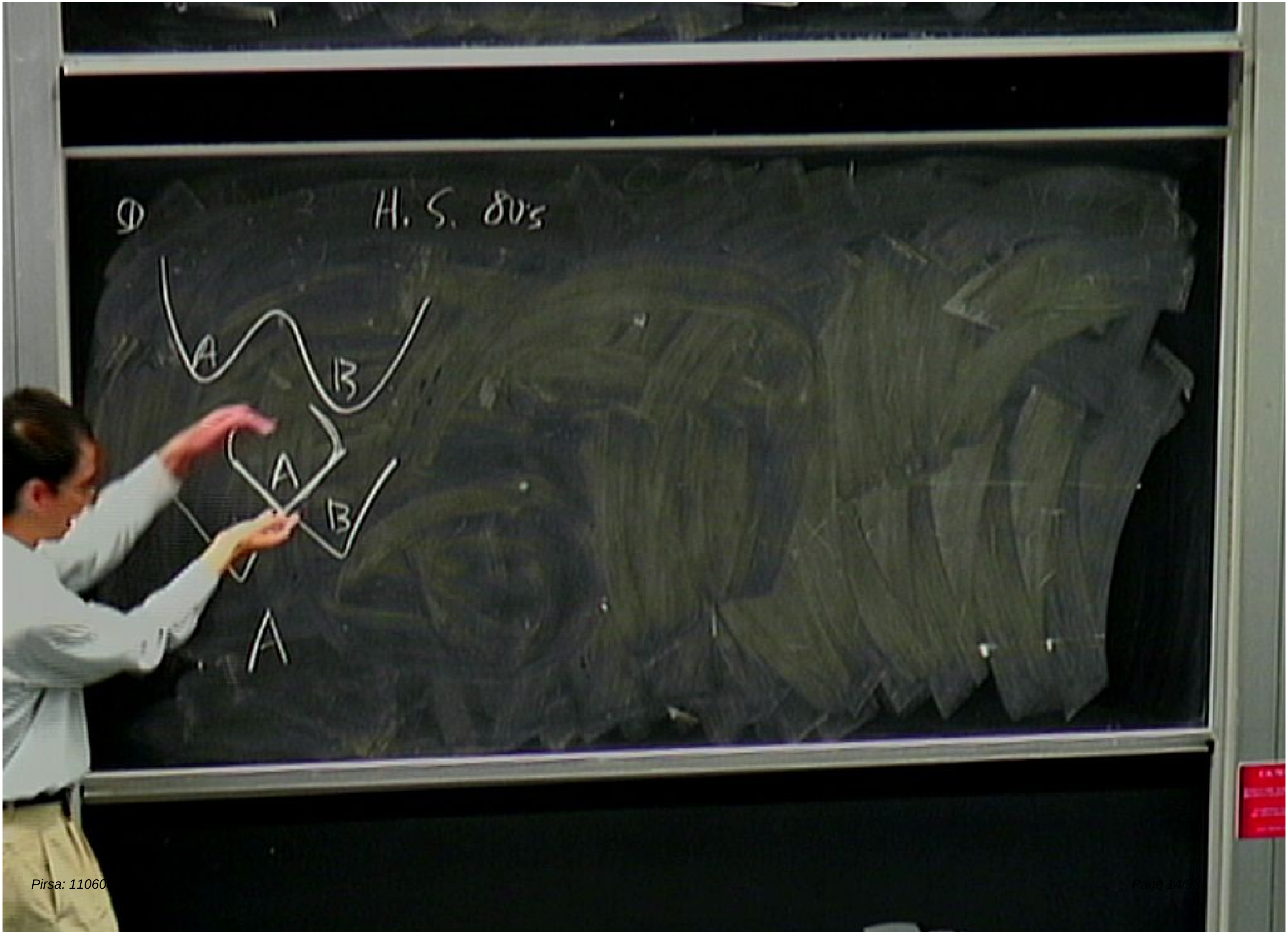

Explore the Landscape through
Classical Transitions

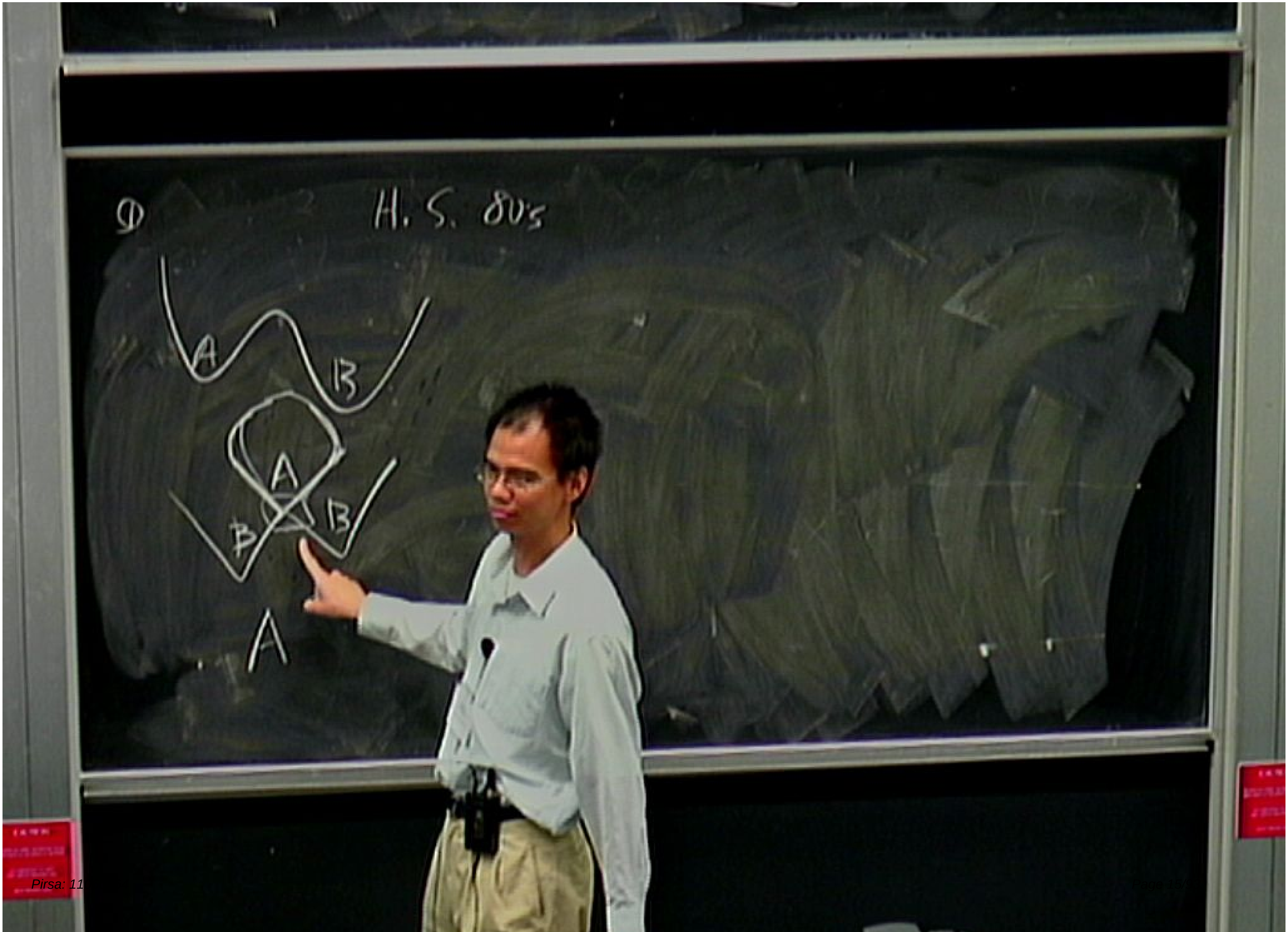



A
B
B
A

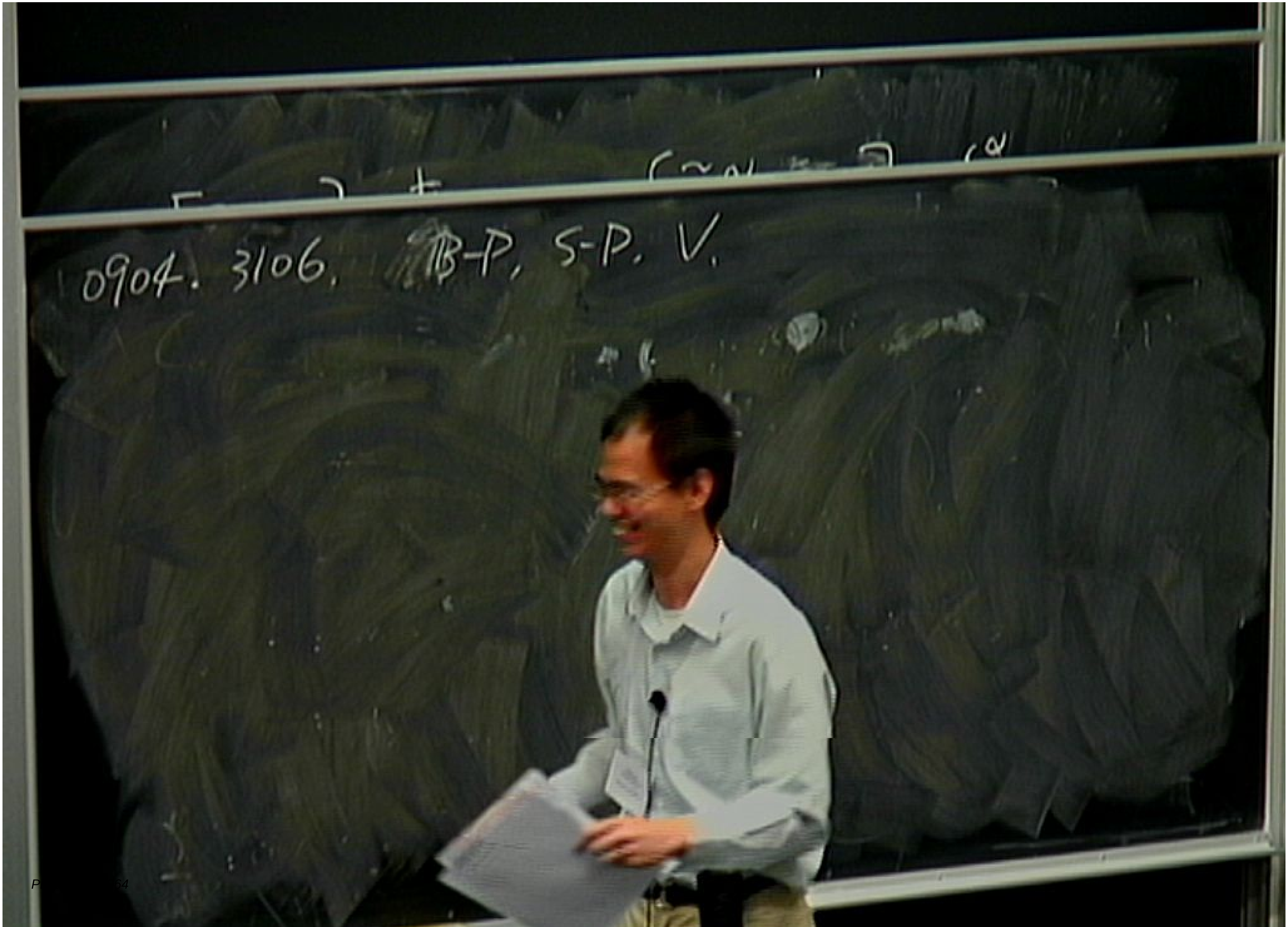

A
B
A
B
B
A

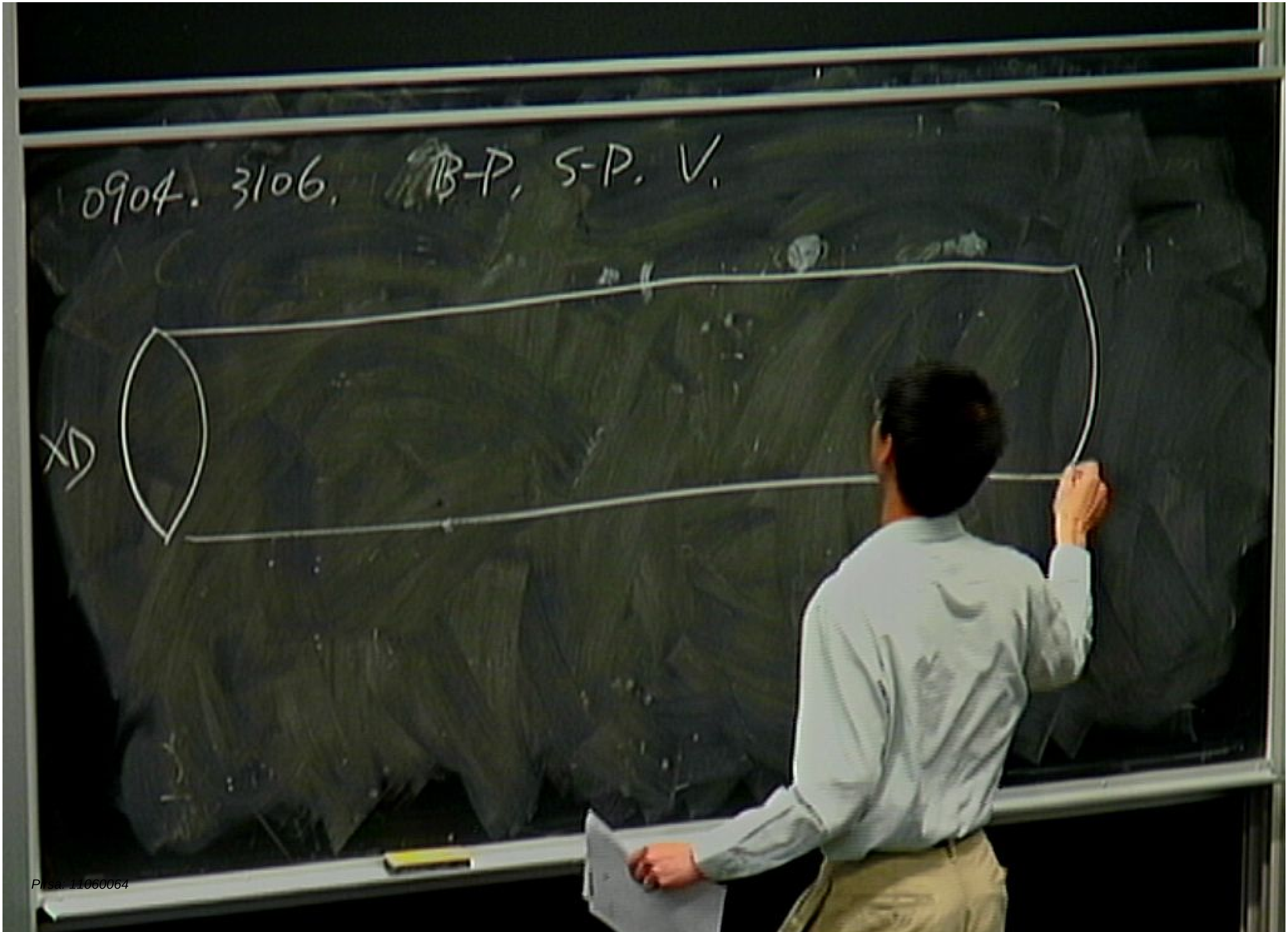

①
H. S. 80's
A
B
A
B
A


H. S. 80's
A
B
A
B
A



①
H. S. 80's
A
B
A
B
B
A


0904. 3106. B-P. S-P. V.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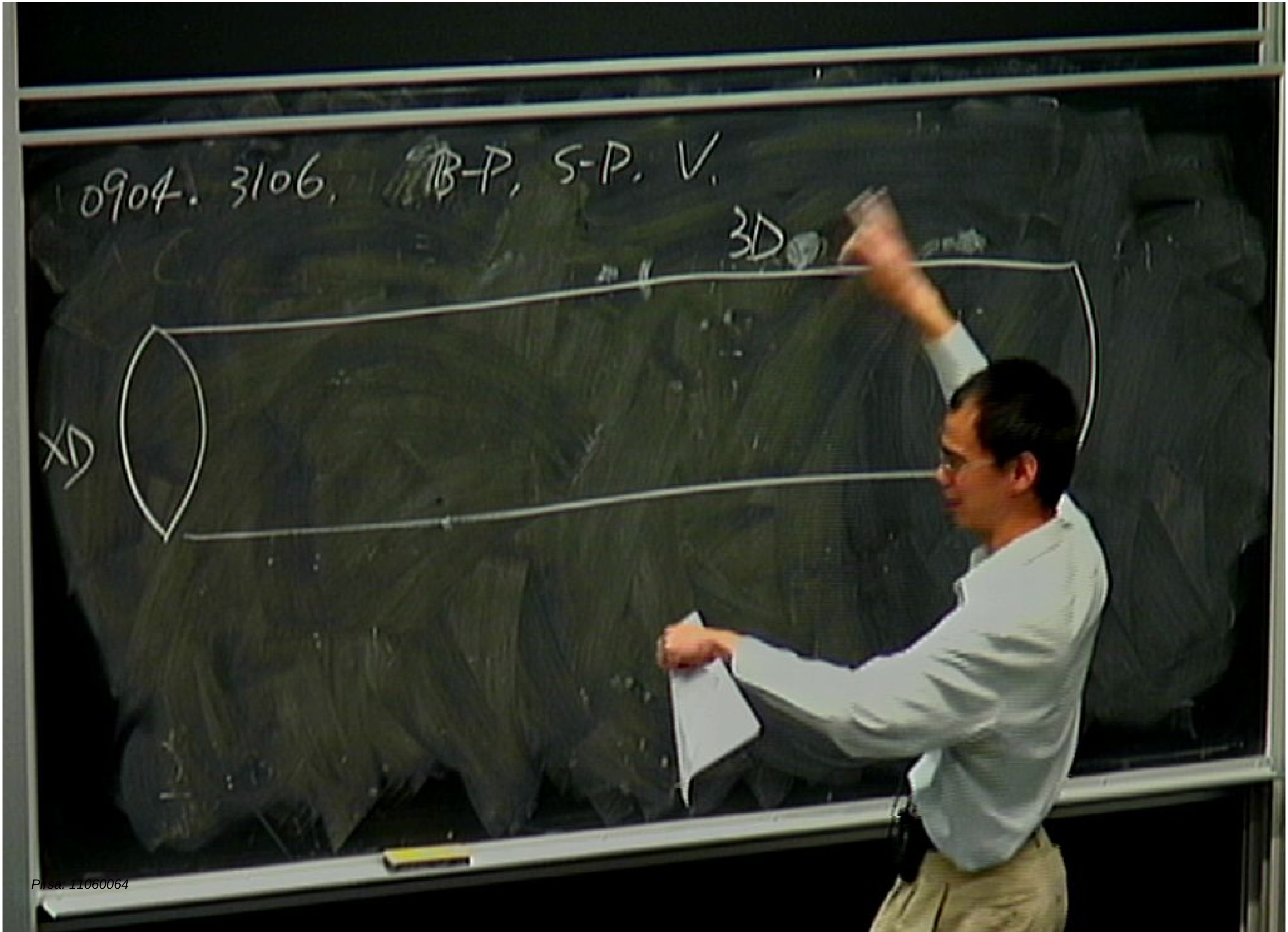
XD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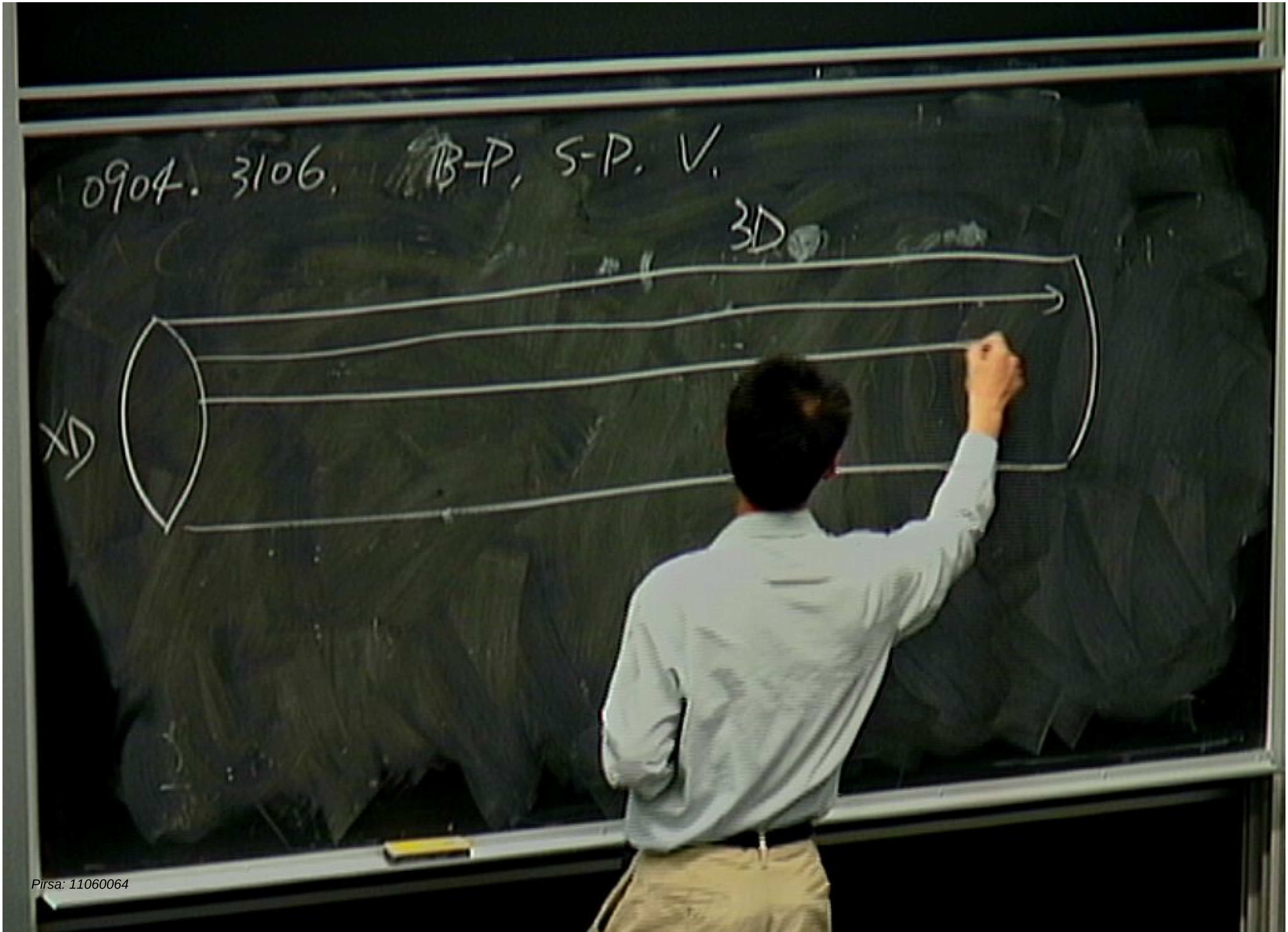
3D
XD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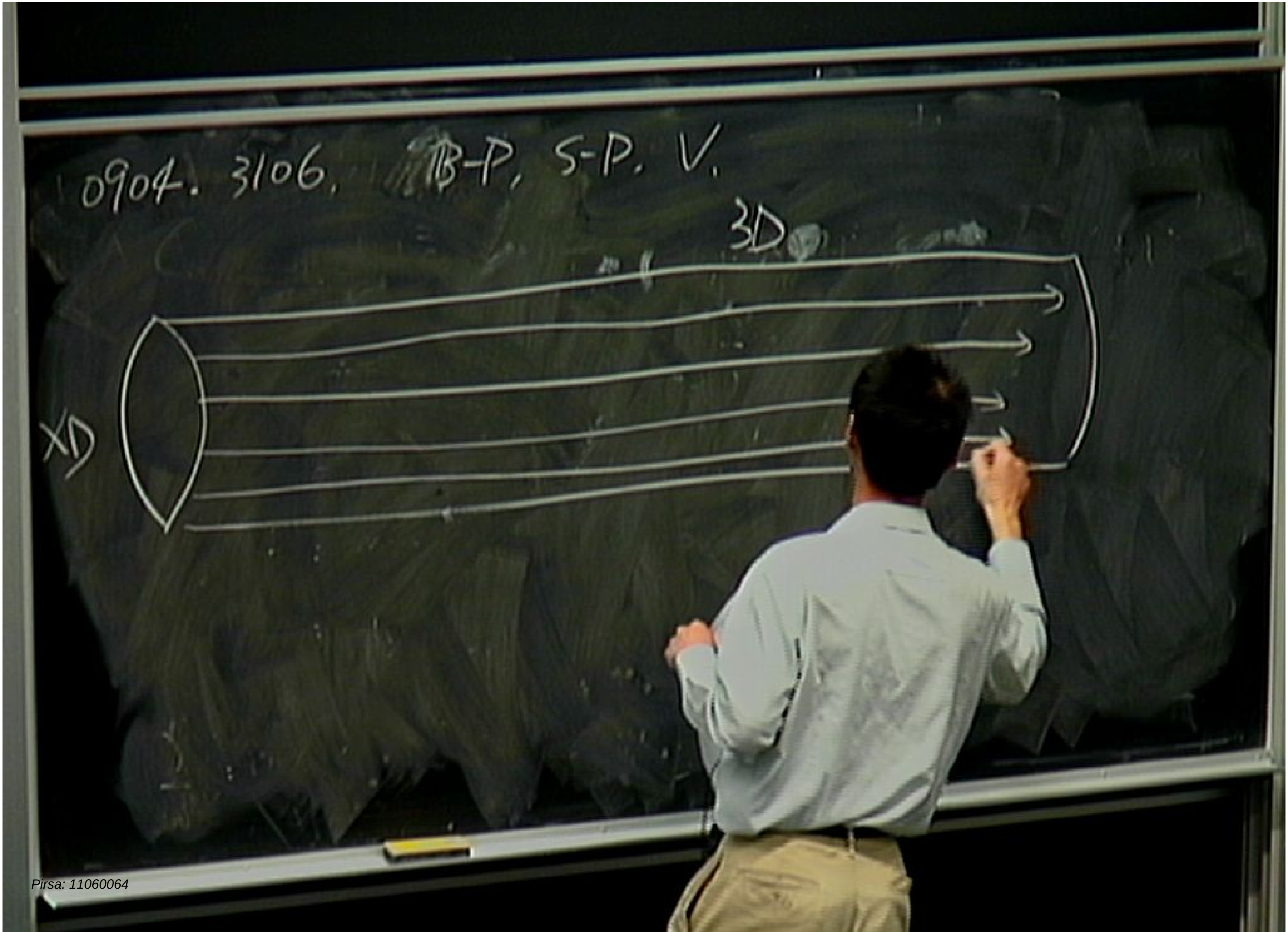
3D
XD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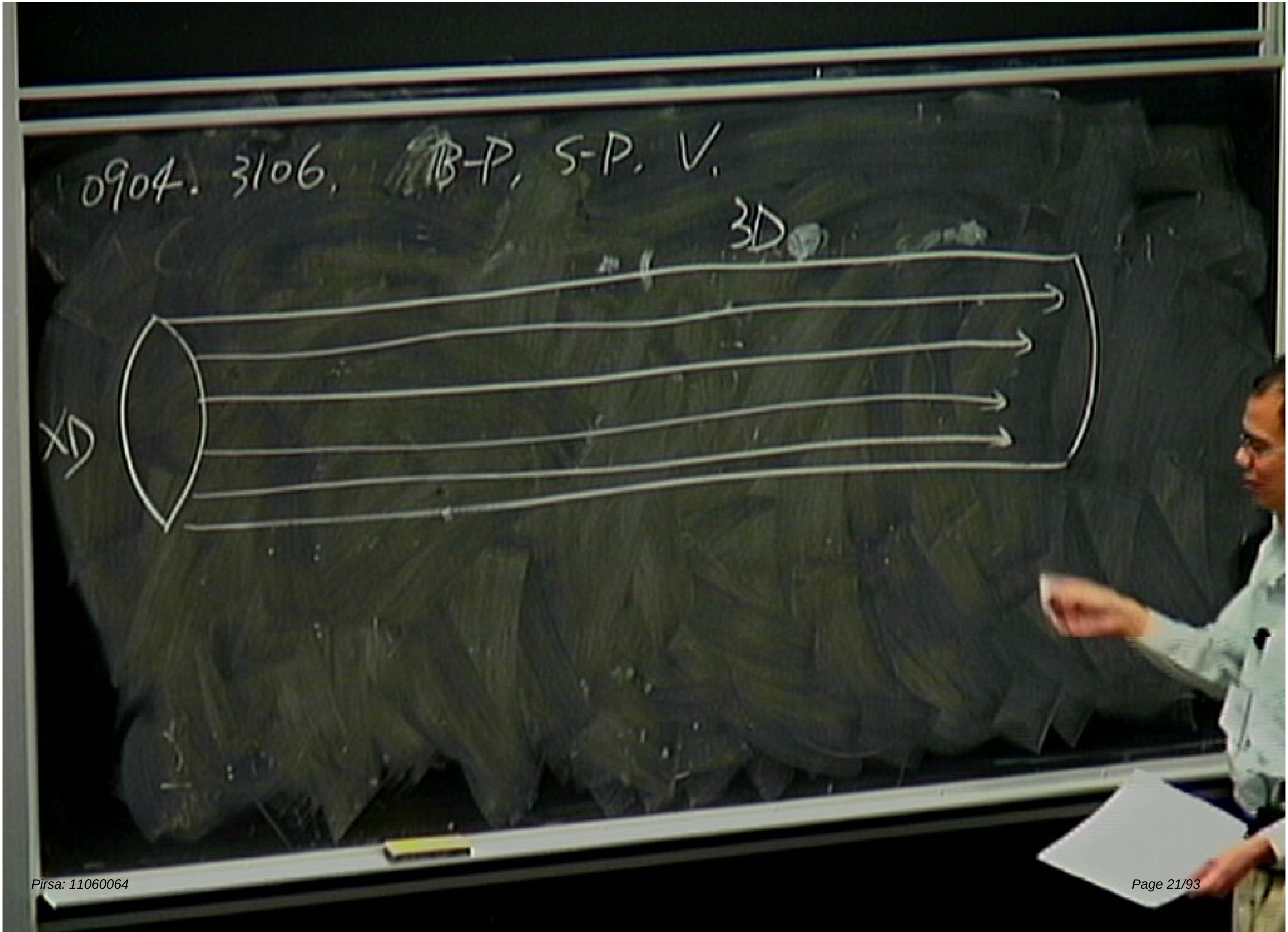
3D
XD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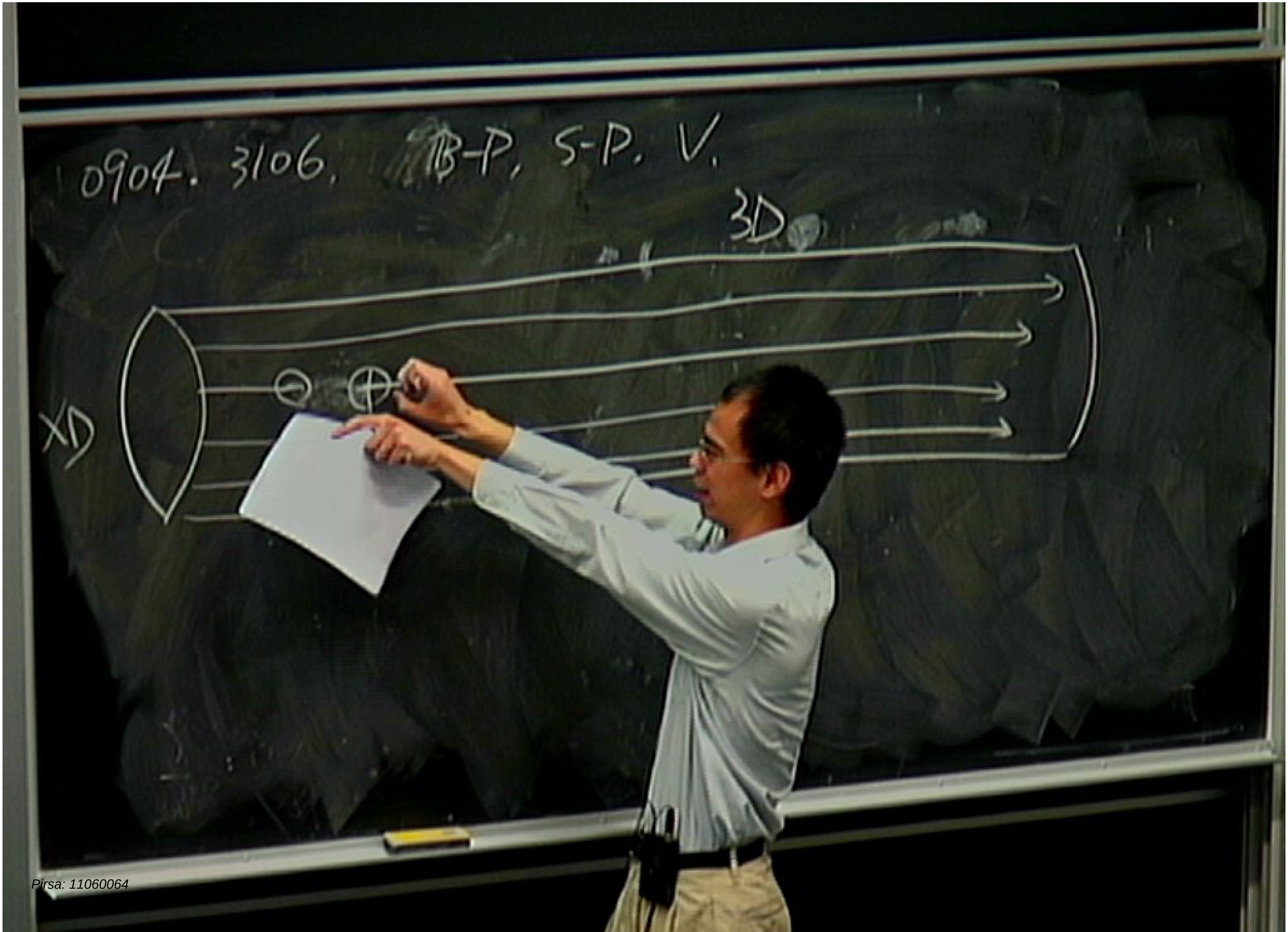
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3D
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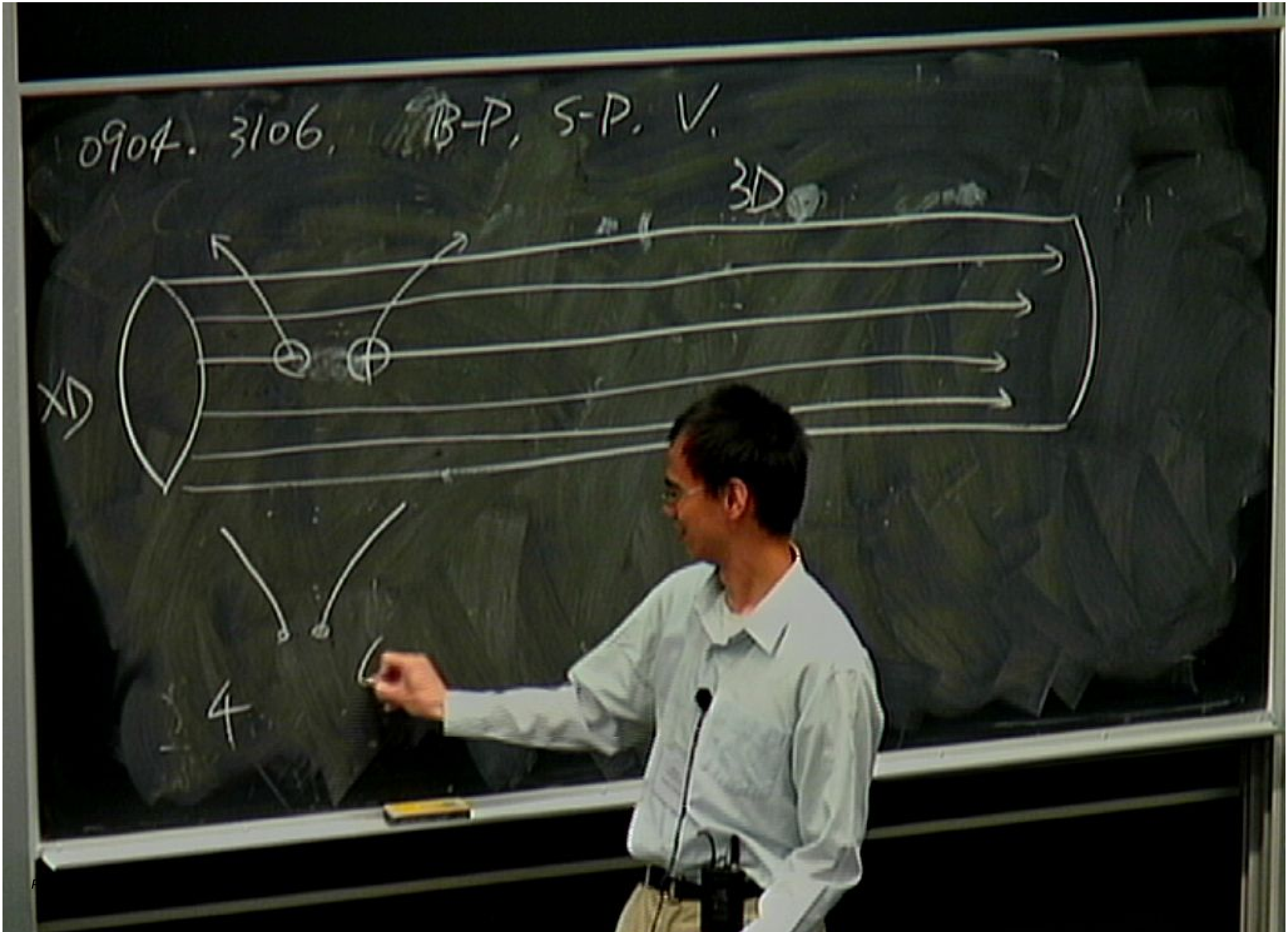
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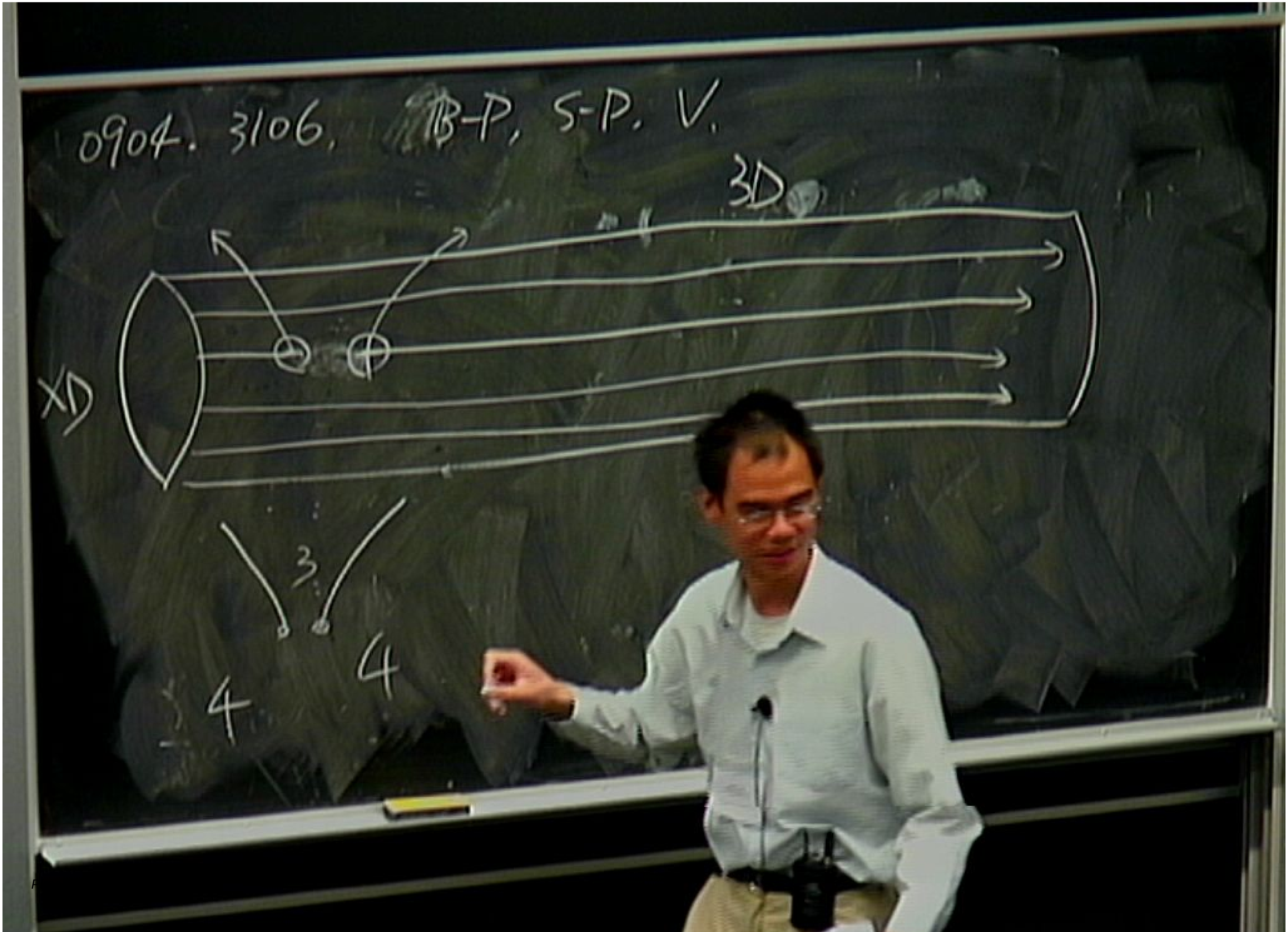
3D
XD
4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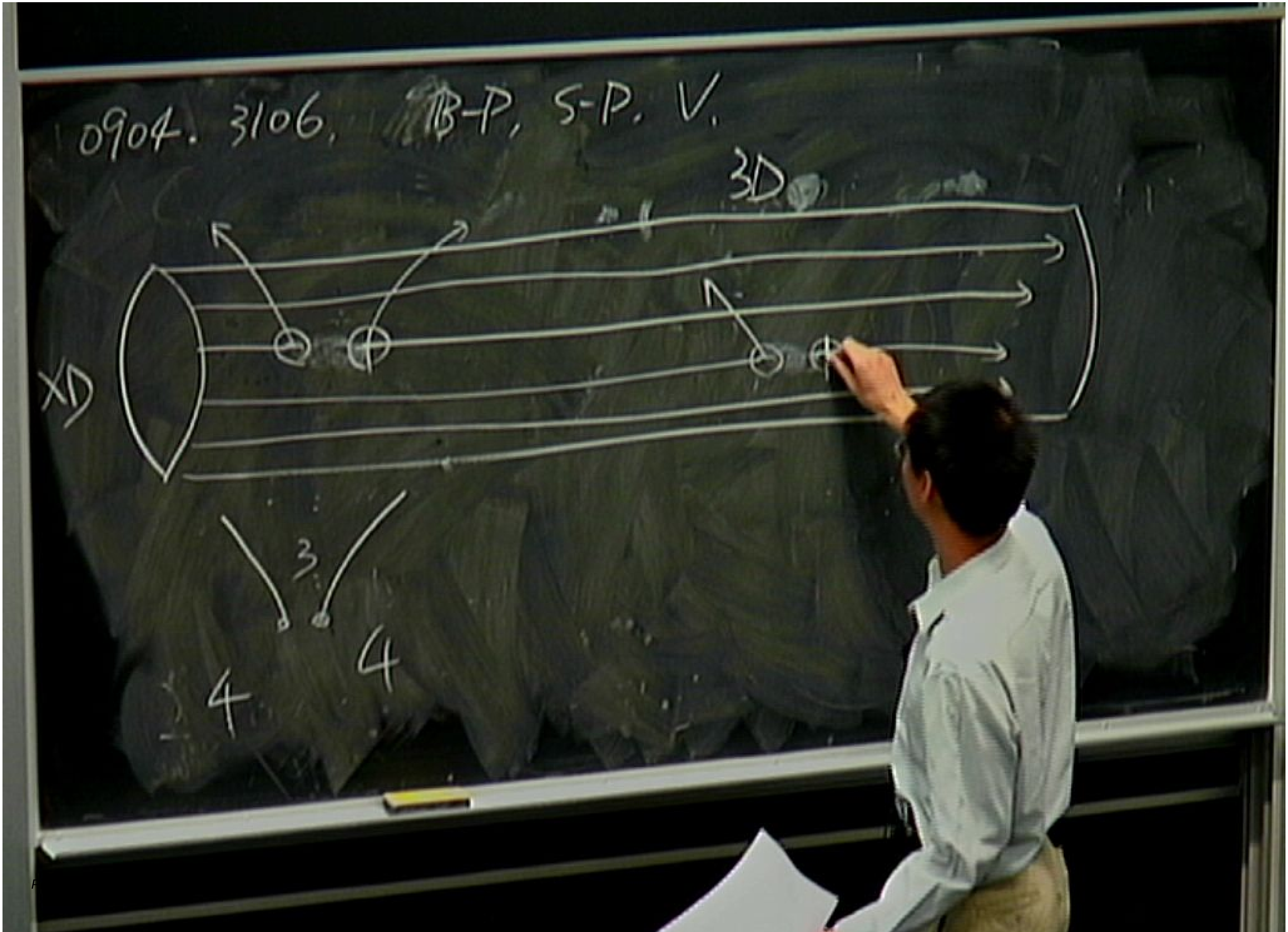
3D
XD
3
4
4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XD
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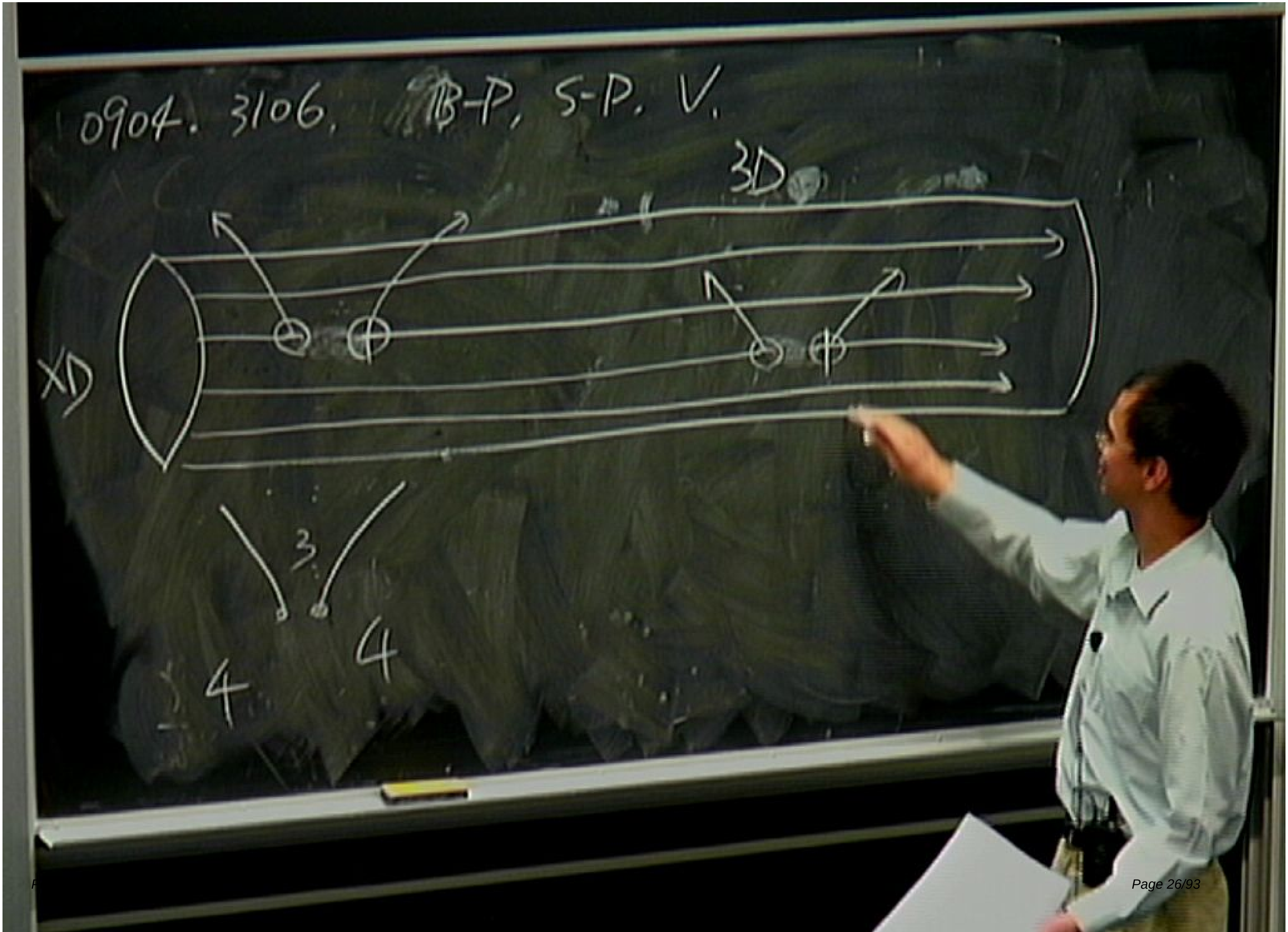
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S-P. V.
3D
XD
3
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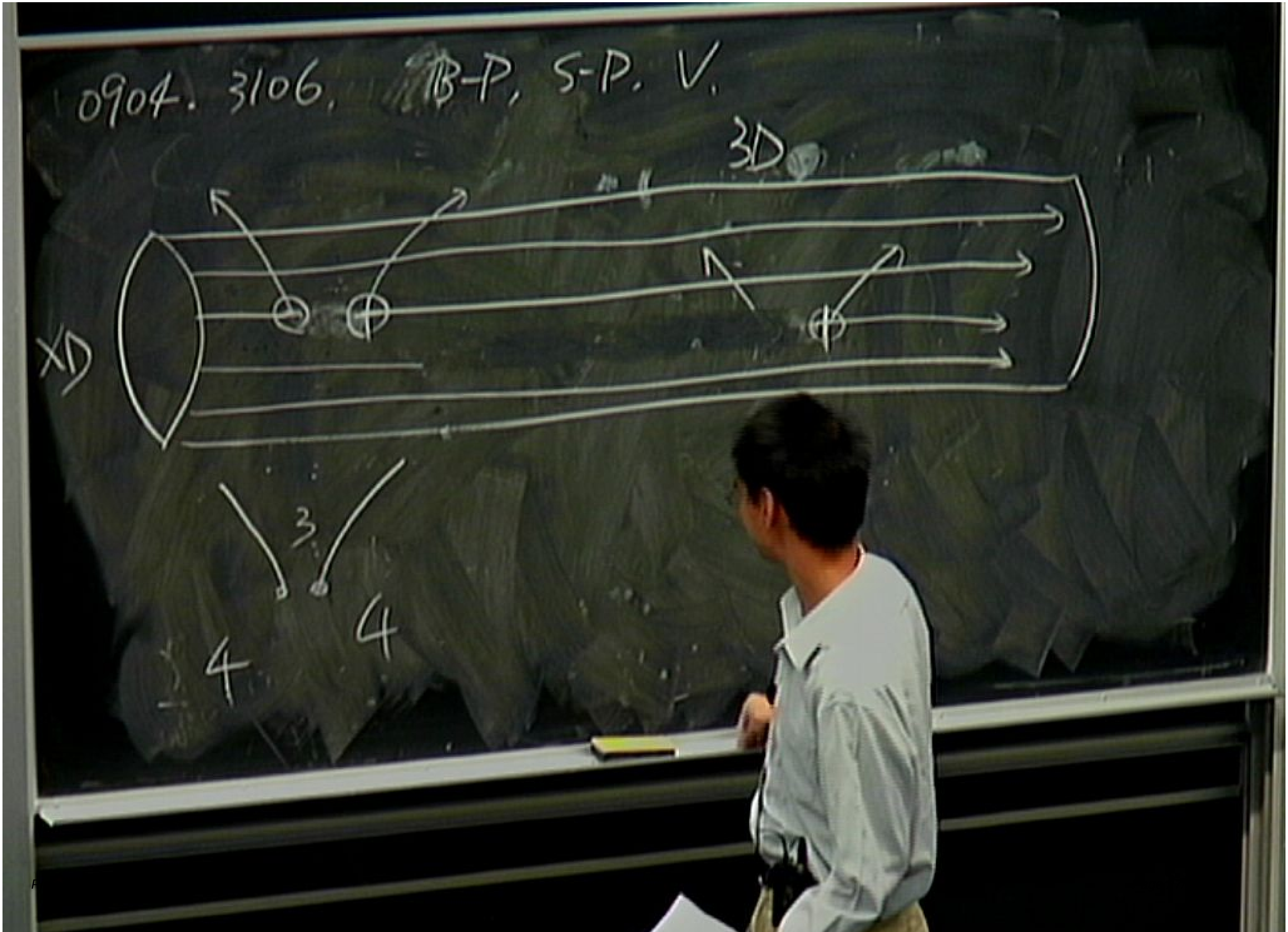
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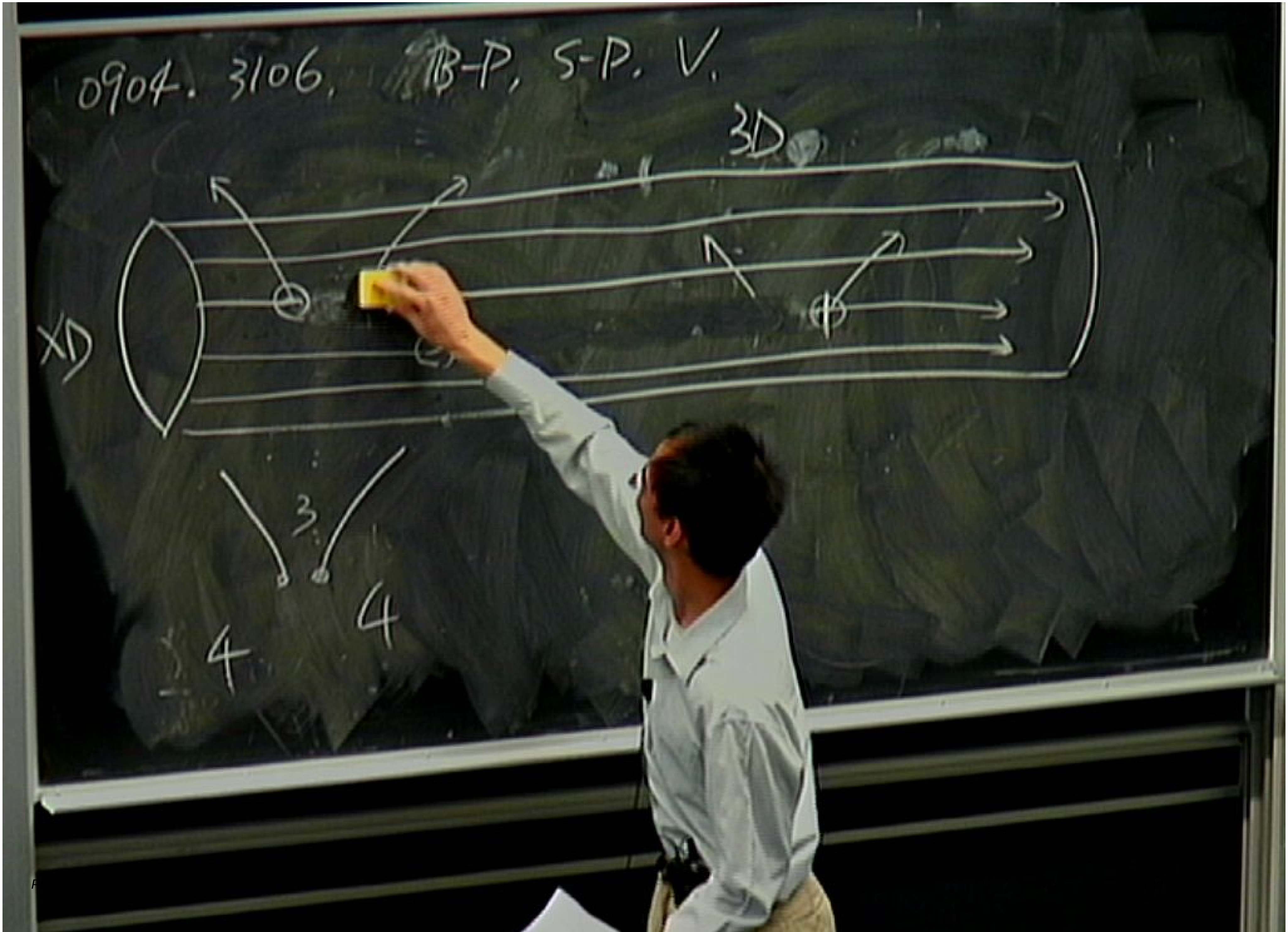
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XD
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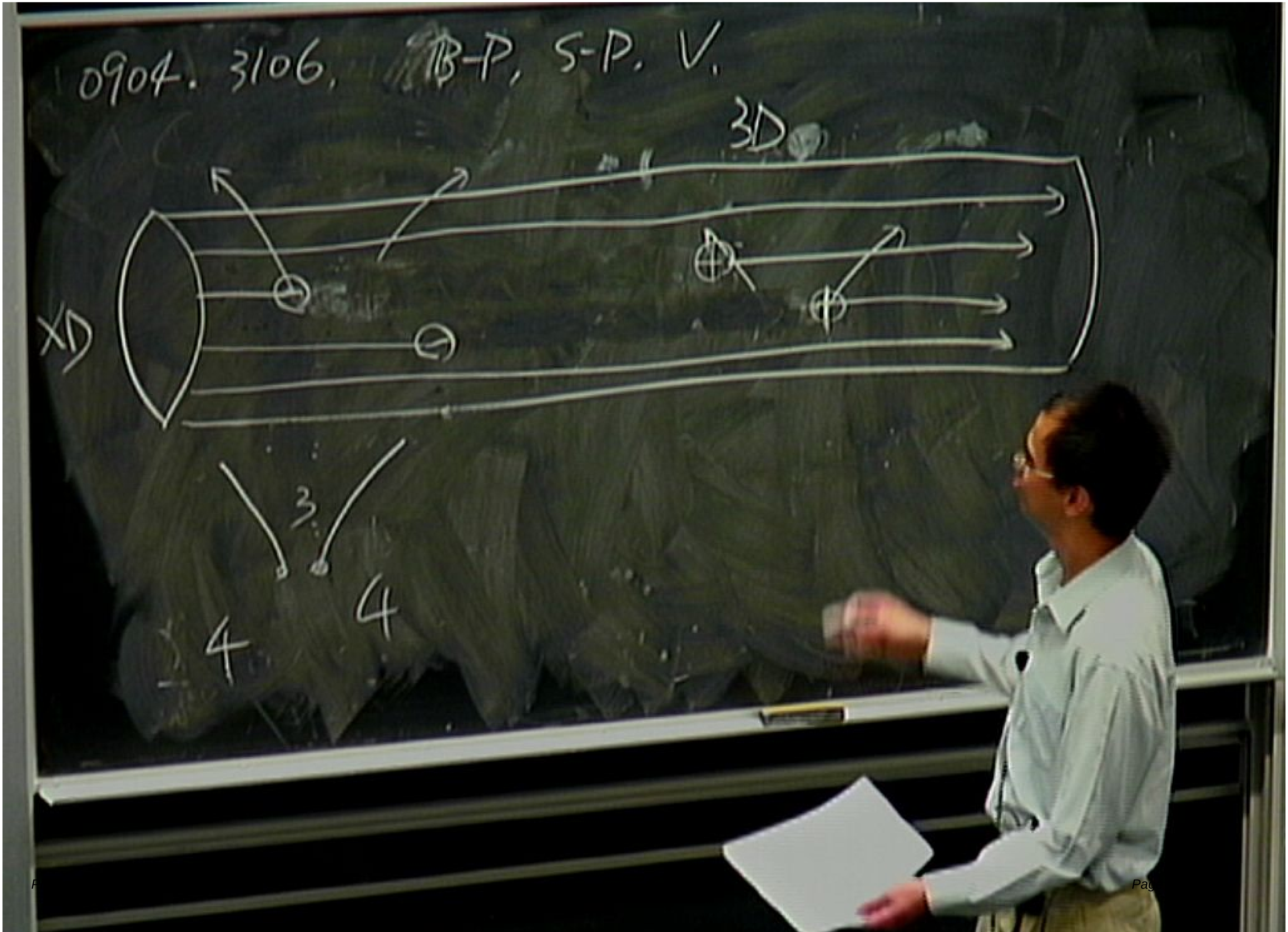
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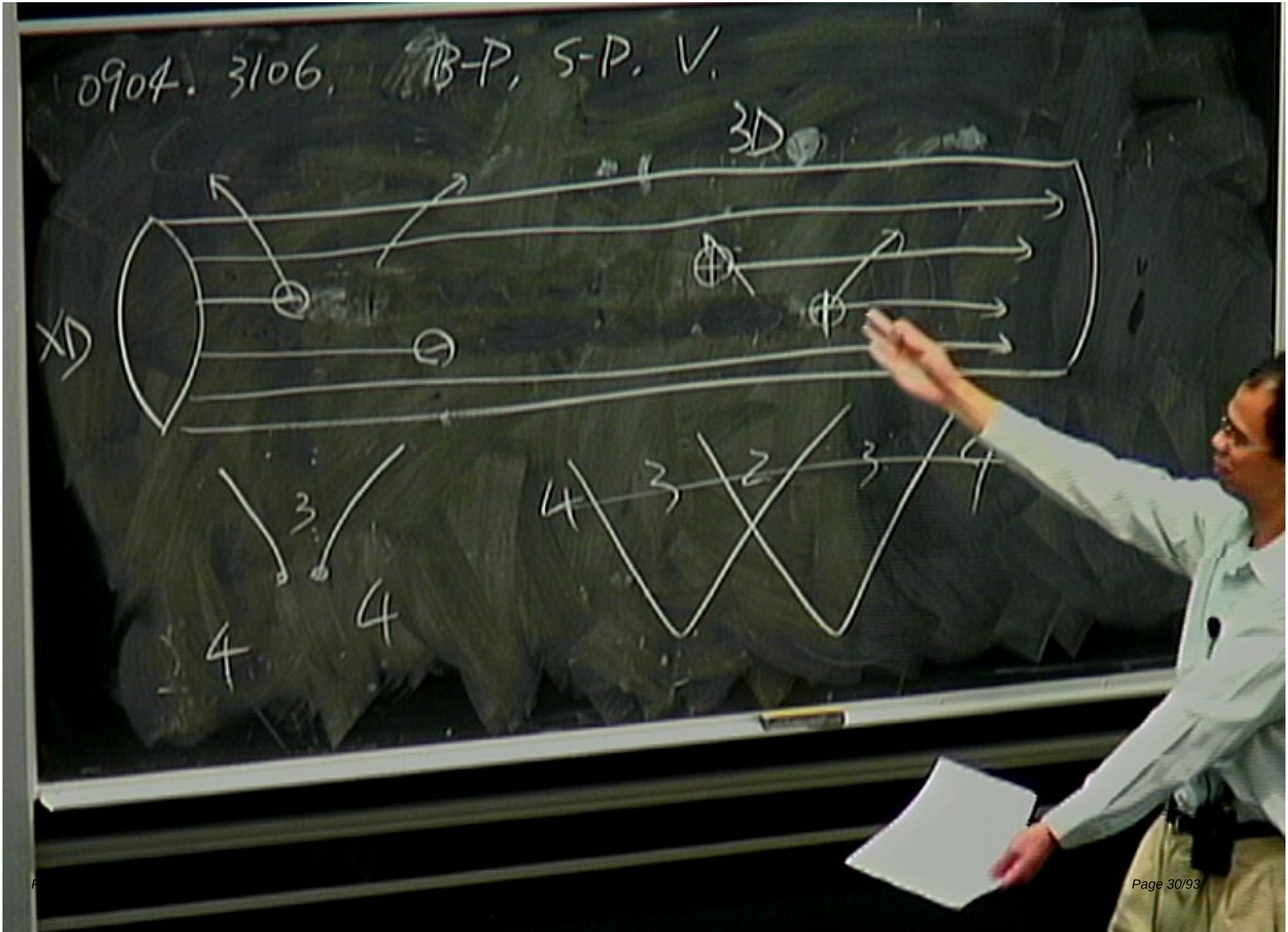
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3D
XD
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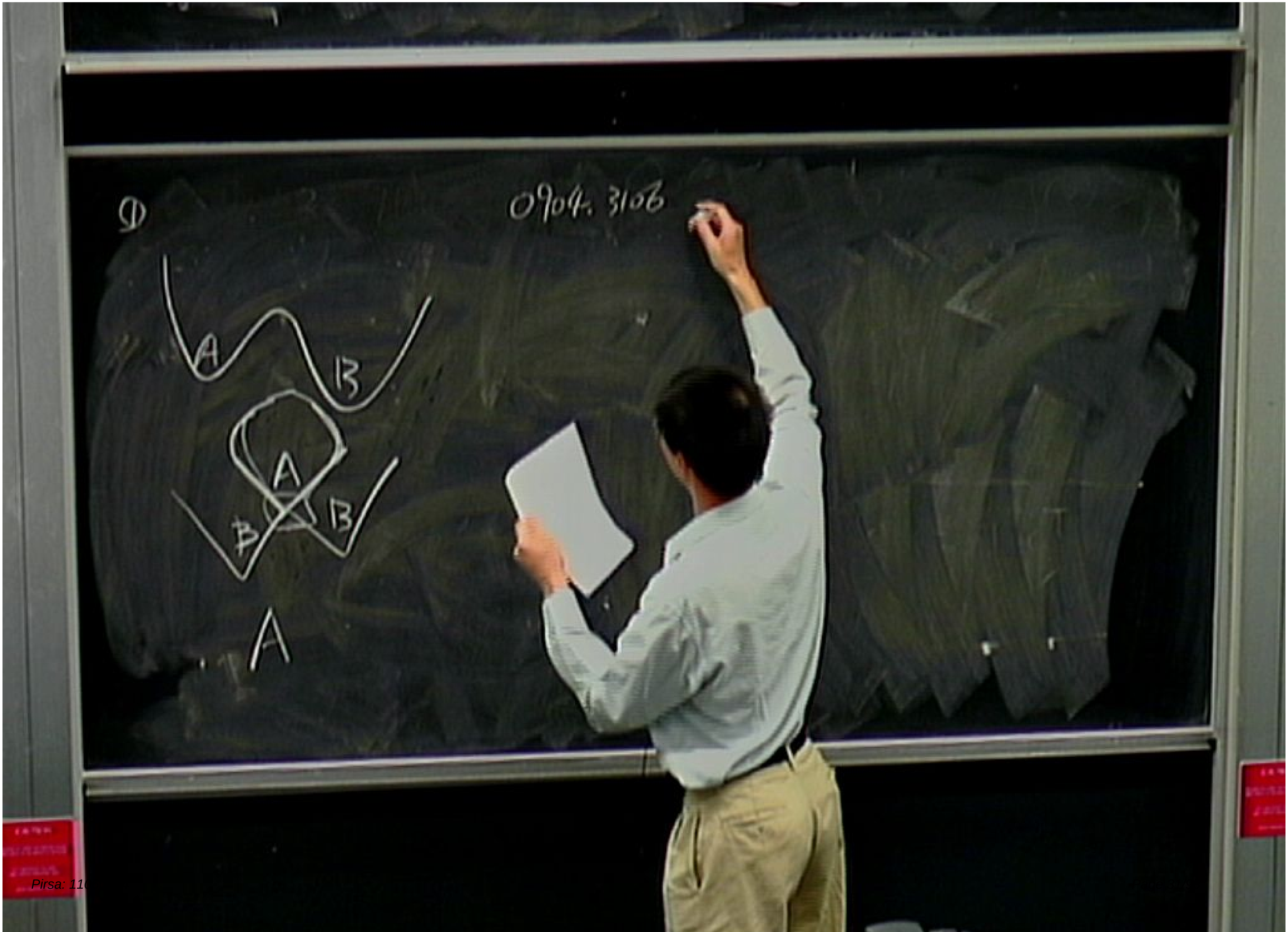
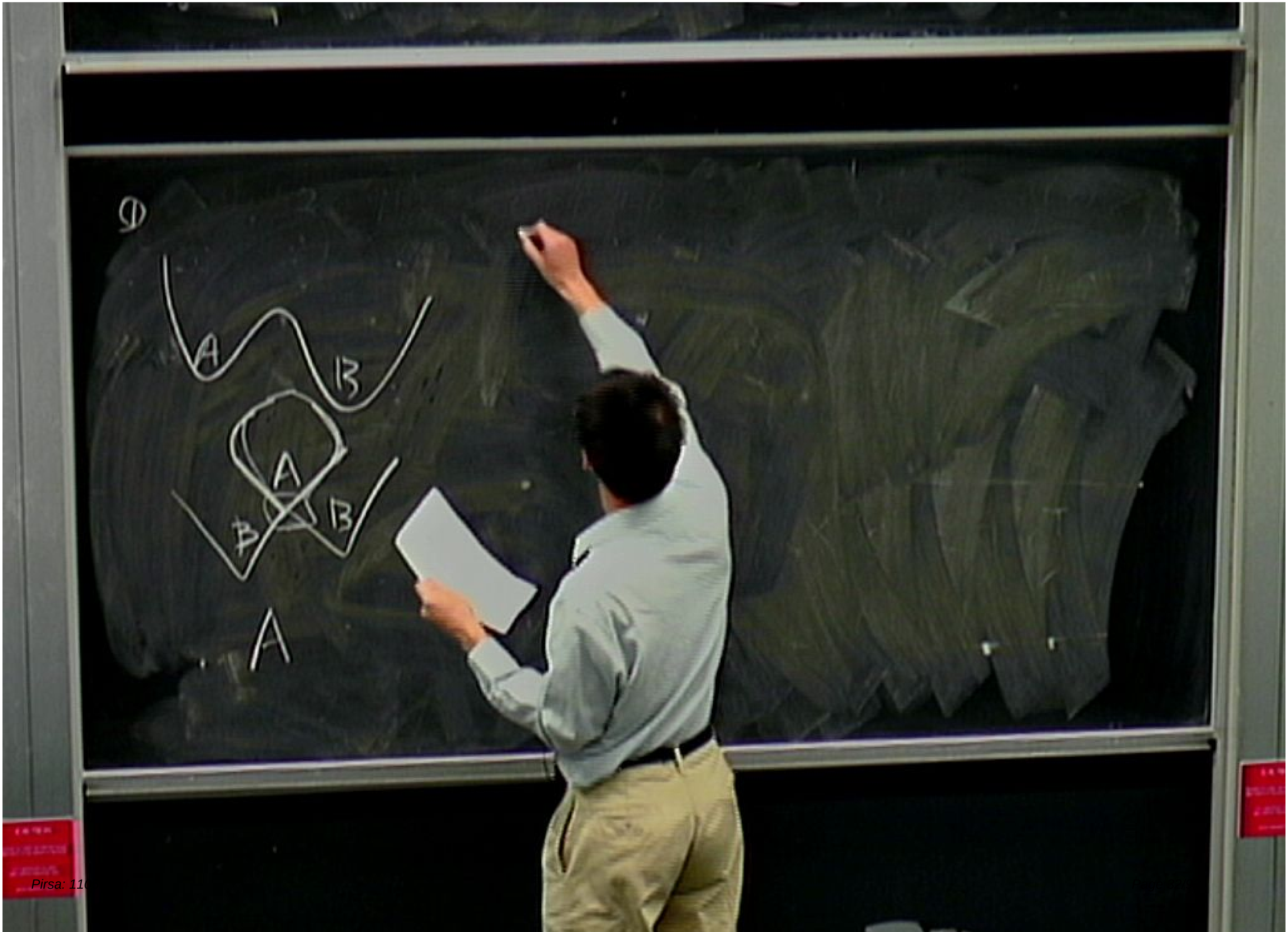
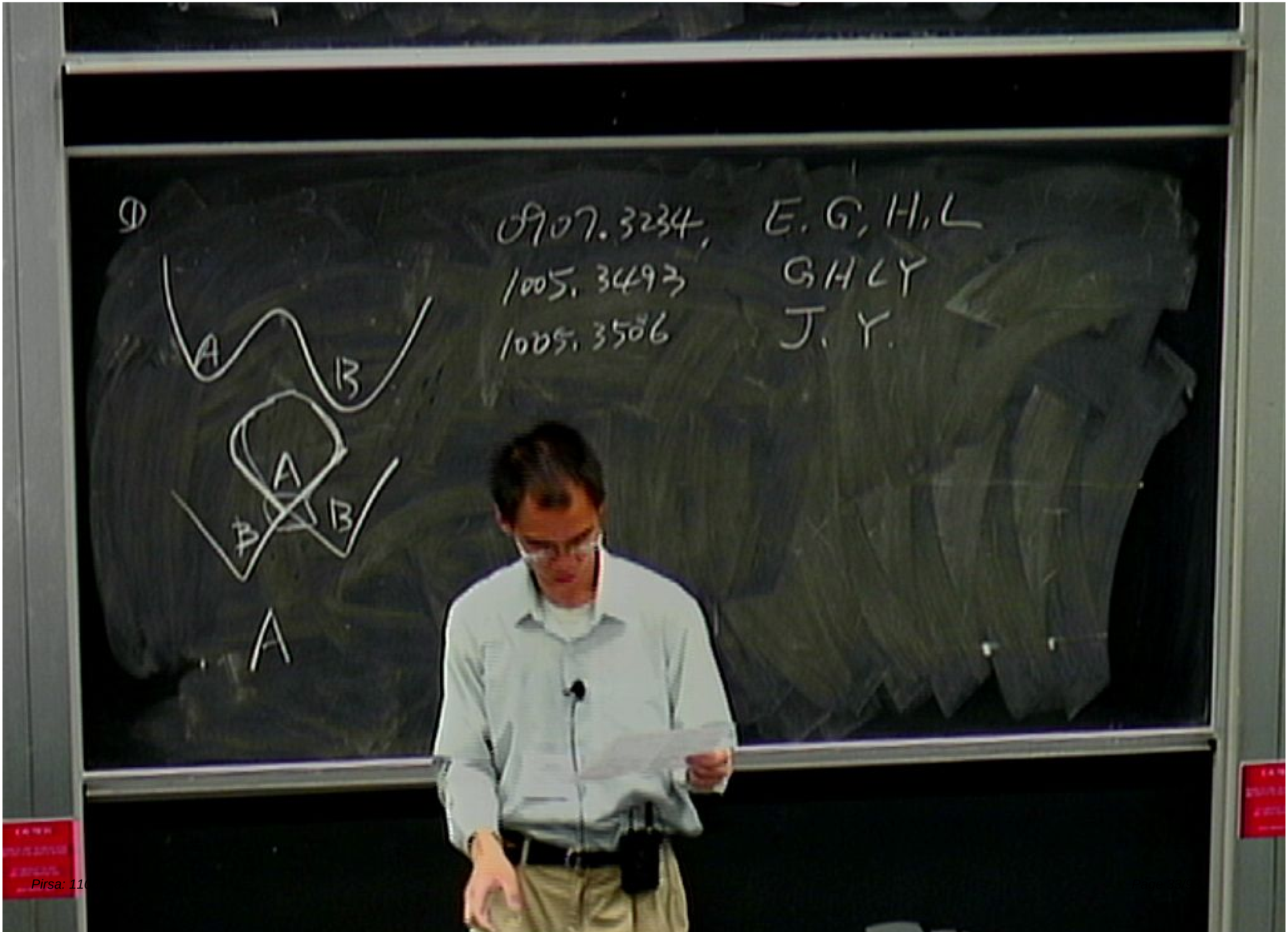
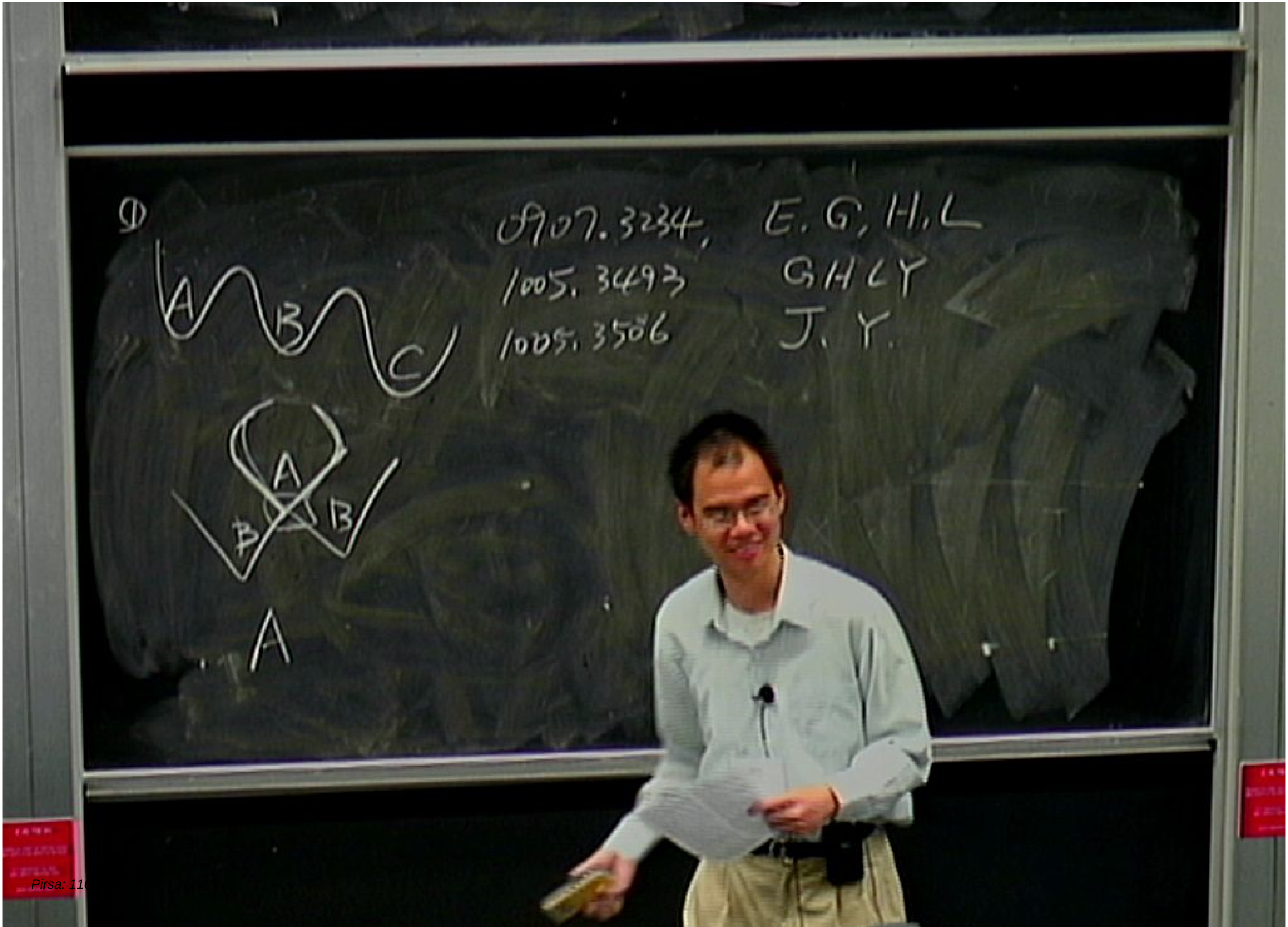
4
4
4
4 3 2 3 4


0904.3106
A
B
A
B
B
A


A
B
A
B
B
A
Pirsa: 11


①
0907.3234, E.G, H, L
1005.3493 GHLY
1005.3506 J. Y.
A
B
A
B
B
A
Pirsa: 11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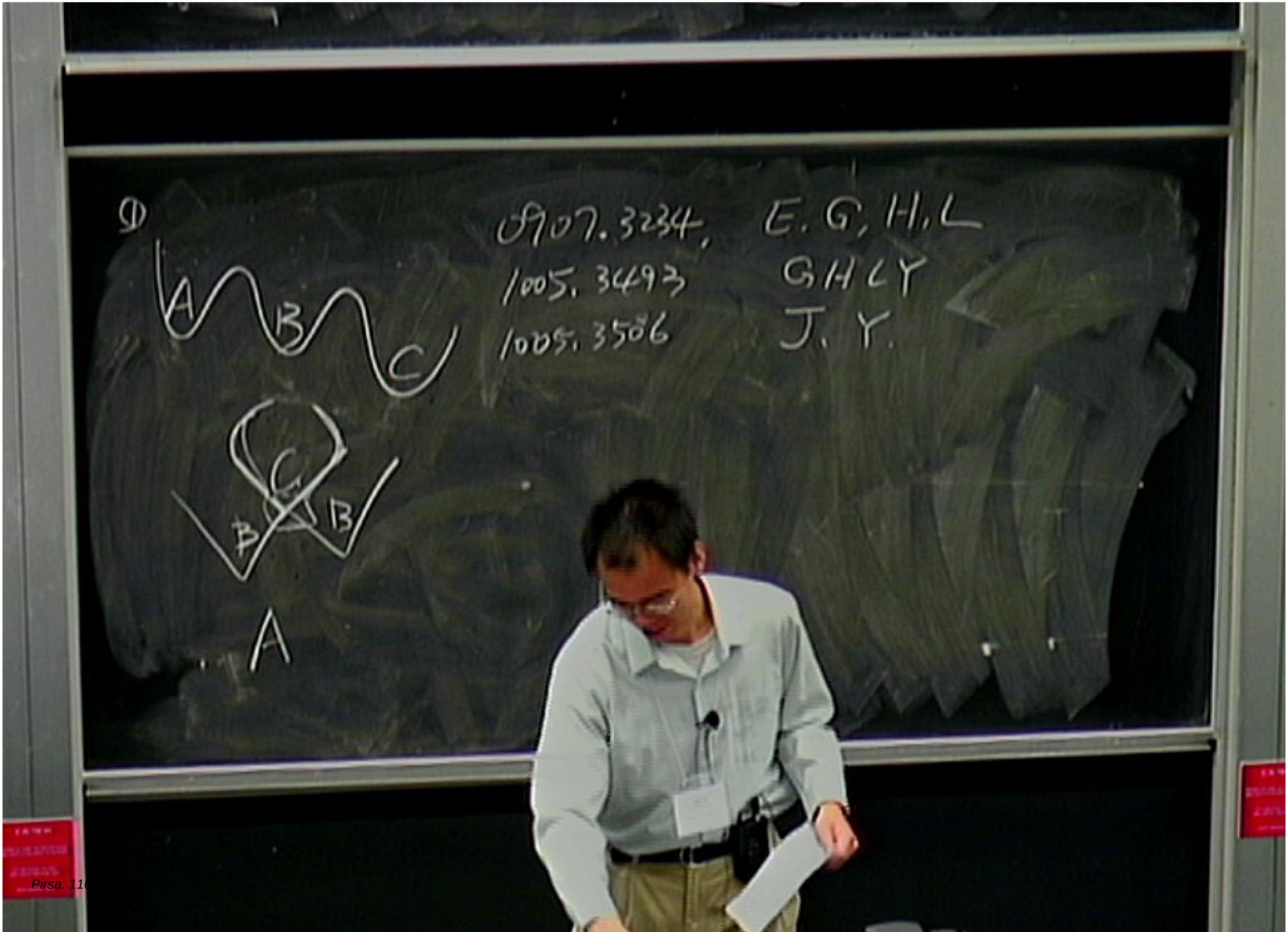
1005.3493 GHLY
1005.3506 J. Y.
A
B
C
A
B
B
A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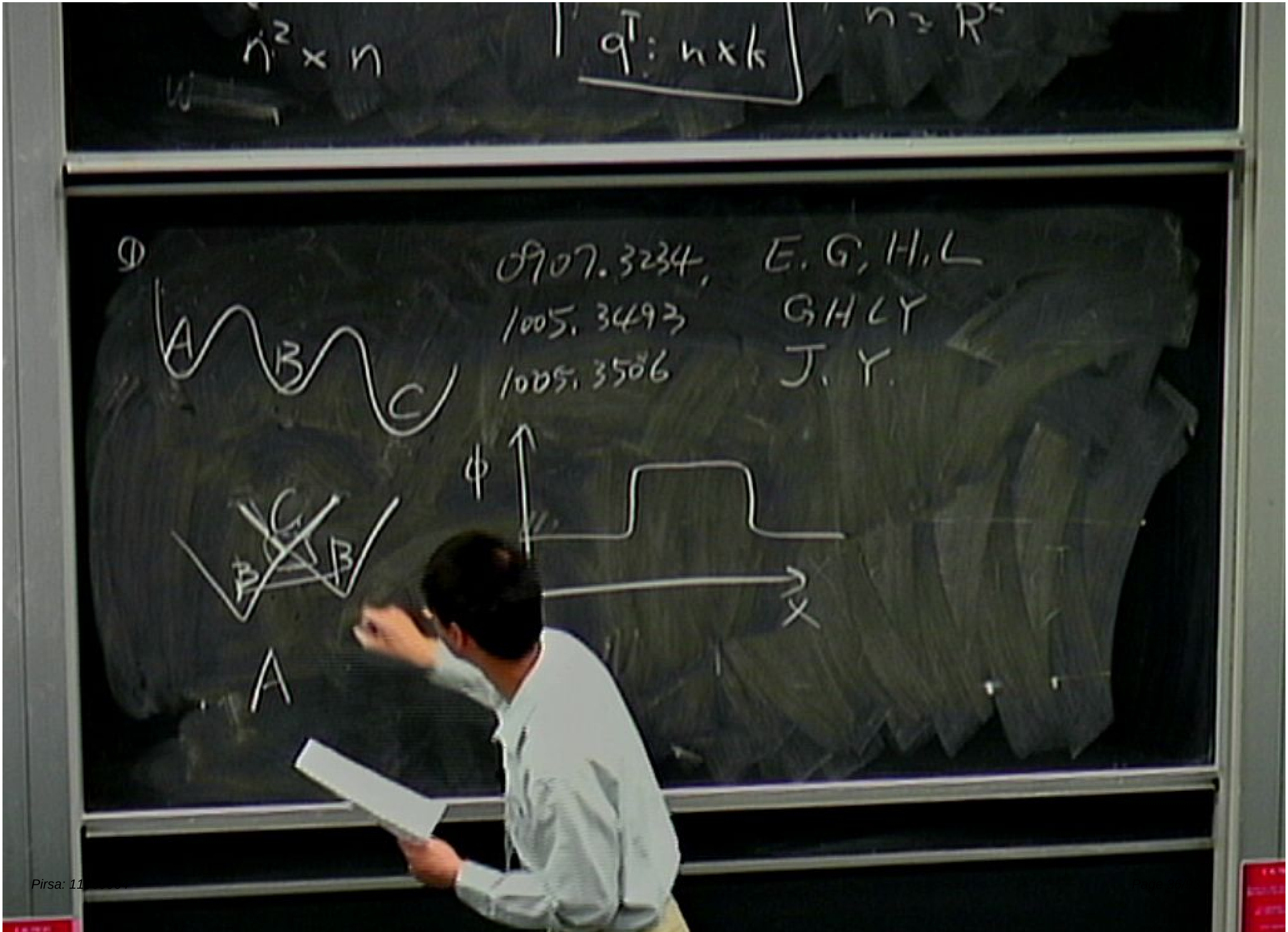
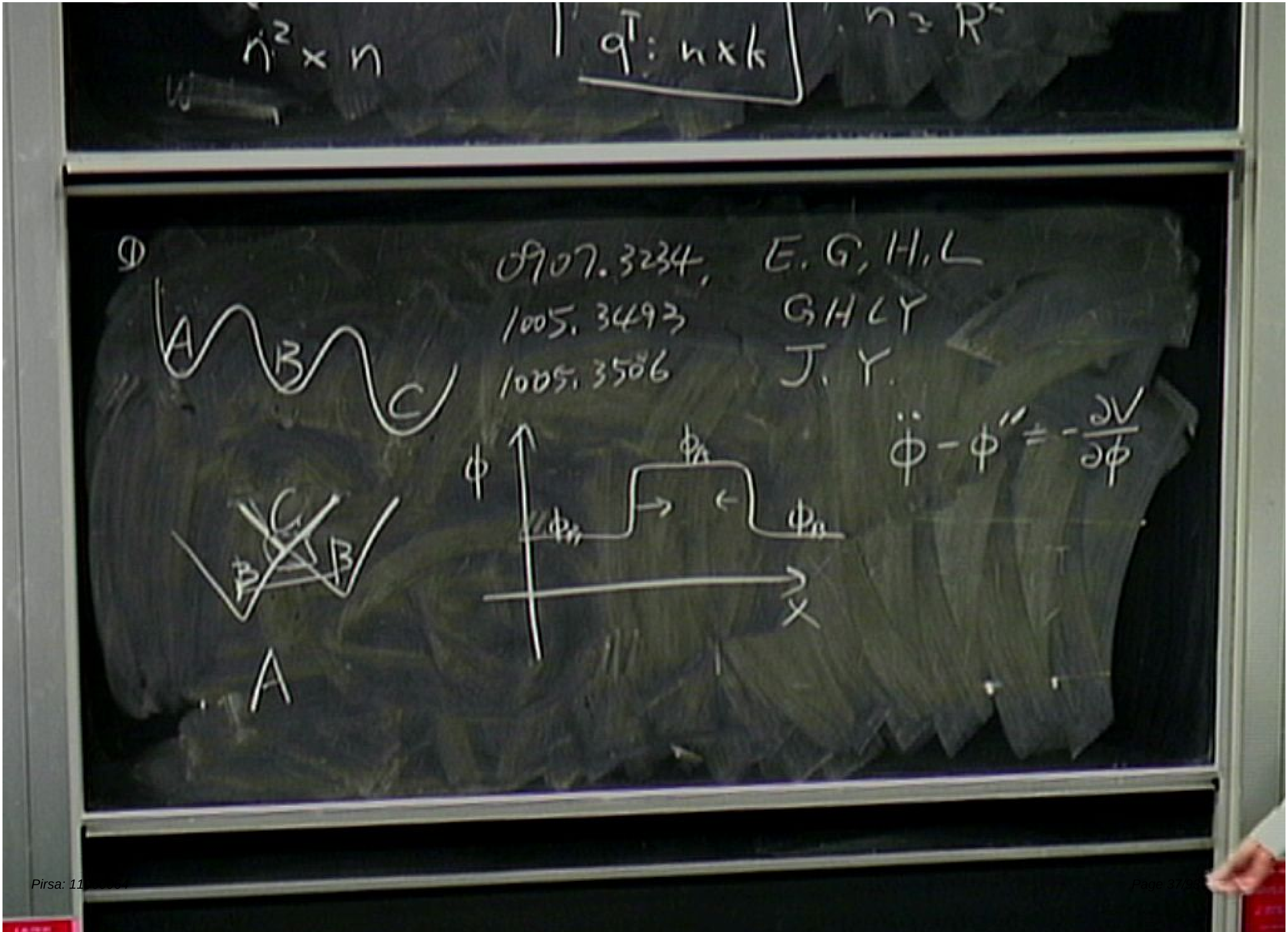
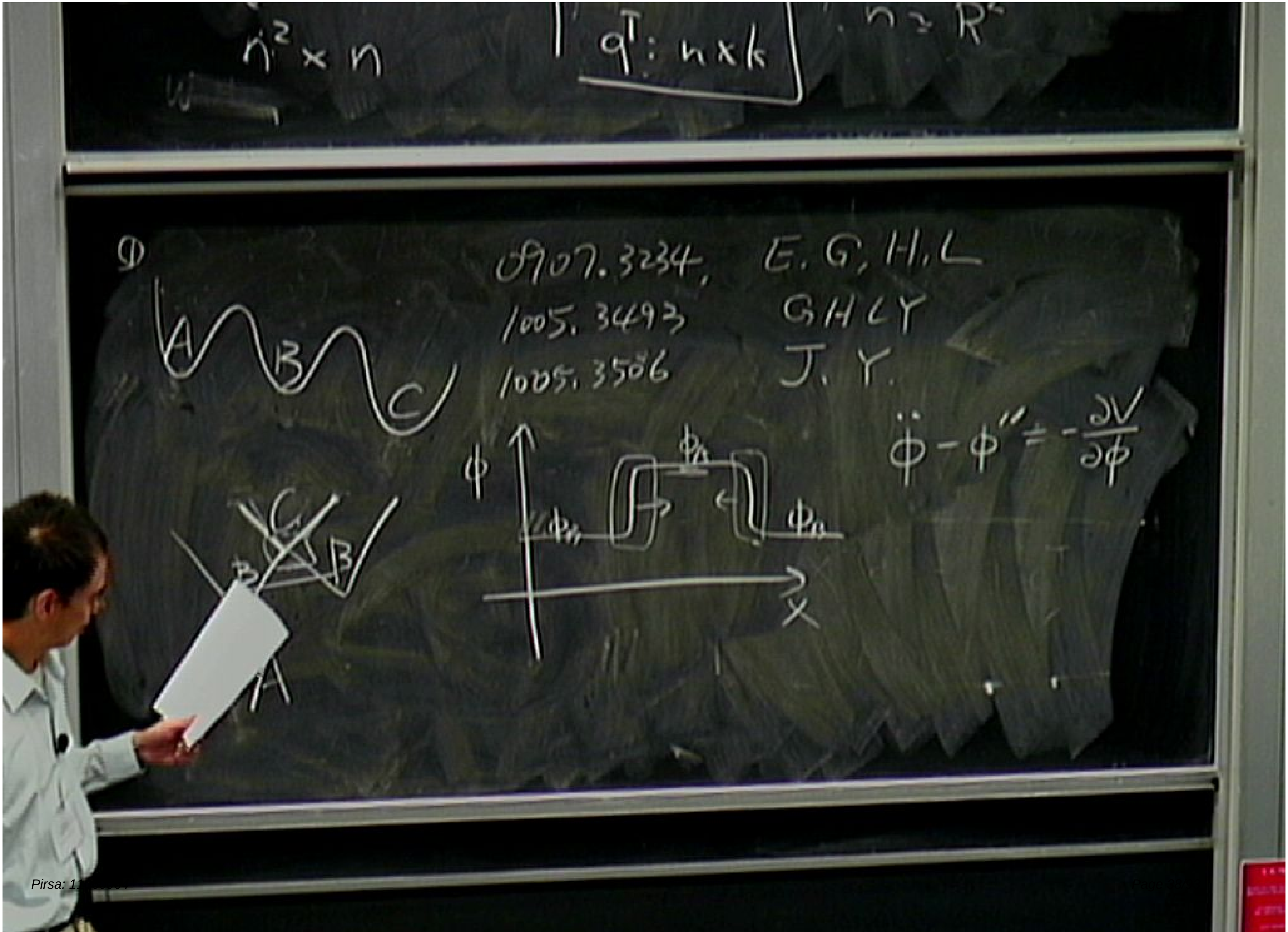
1005.3493 G H L Y
1005.3506 J. Y.
A
B
C
B
B
A
Pirsa: 11

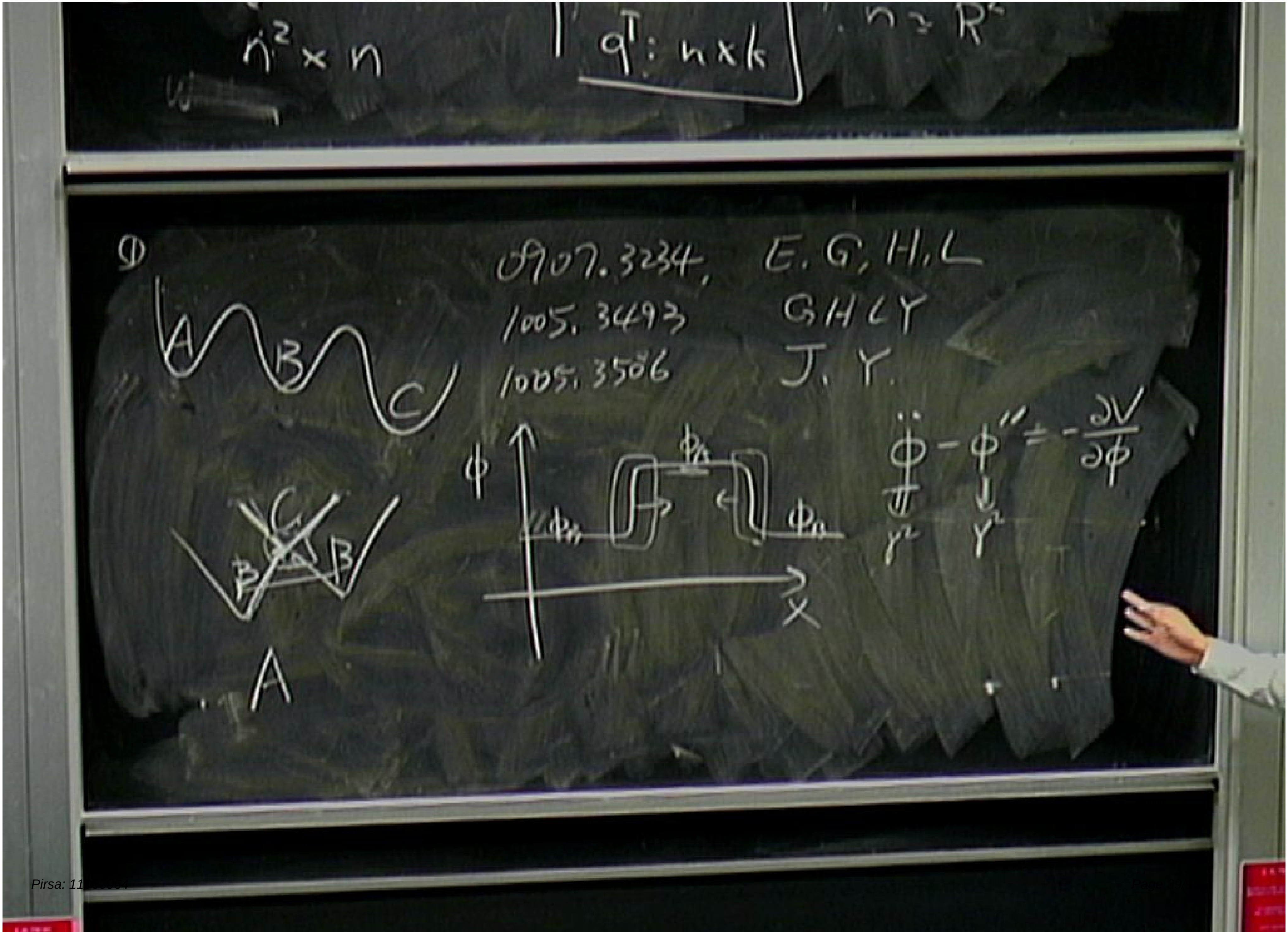

n² × n
q^T : n × k
0907.3234, E. G, H. L
1005.3493 GHLY
1005.3506 J. Y.
A
B
C
φ
x



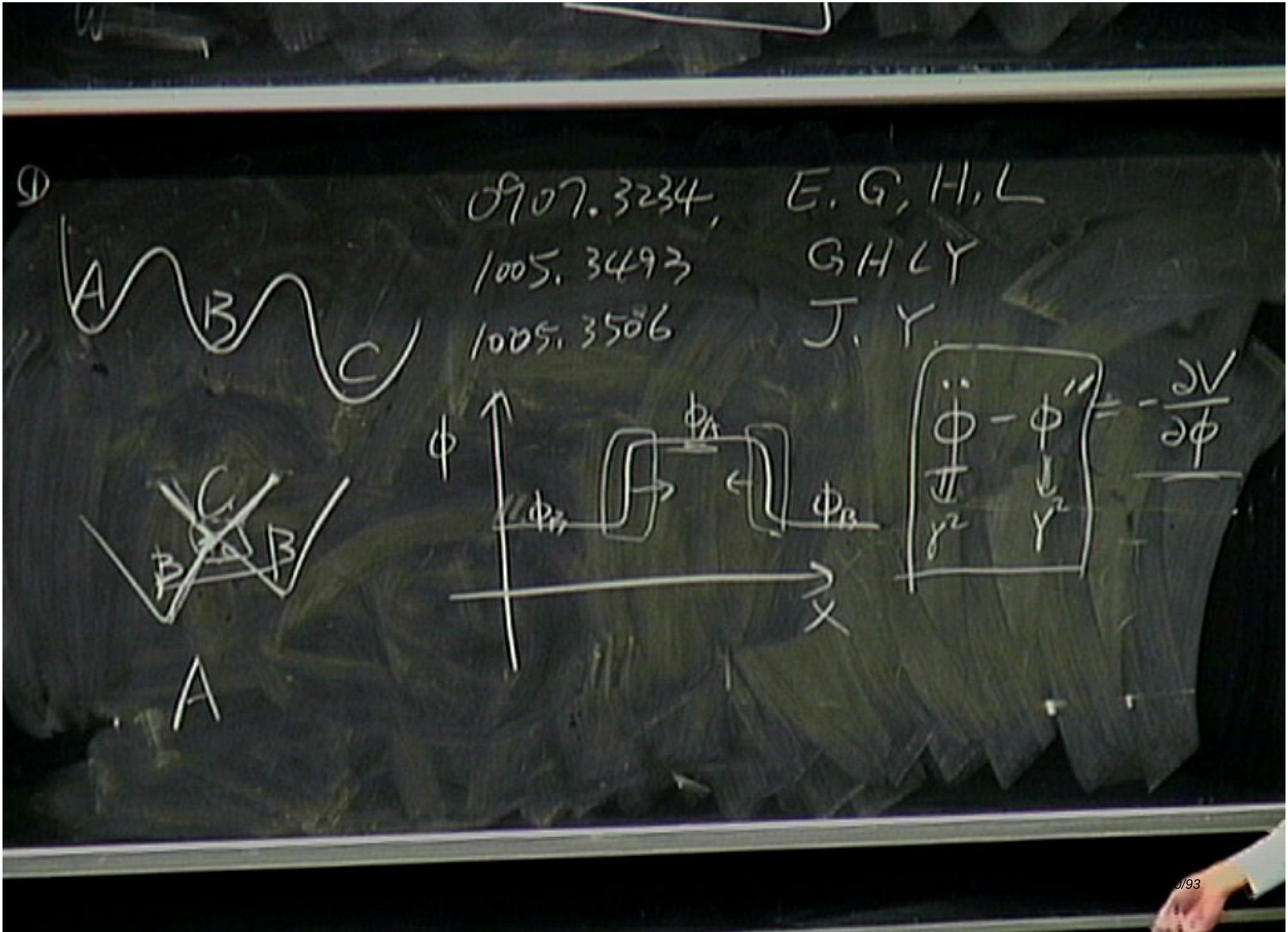
$n^2 \times n$
$q^T : n \times k$
0907.3234, E, G, H, L
1005.3493 GHLY
1005.3506 J. Y.
A
B
C
ϕ
ϕ_A
ϕ_B
x
$\ddot{\phi} - \phi'' = -\frac{\partial V}{\partial \phi}$



n² × n
qᵀ: n×k
0907.3234, E. G, H, L
1005.3493 GHLY
1005.3506 J. Y.
A
B
C
φ
x
φ̈ − φ″ = −∂V/∂φ



n² × n
qᵀ : n×k
0907.3234, E. G, H. L
1005.3493 GHLY
1005.3506 J. Y.
A
B
C
ϕ
x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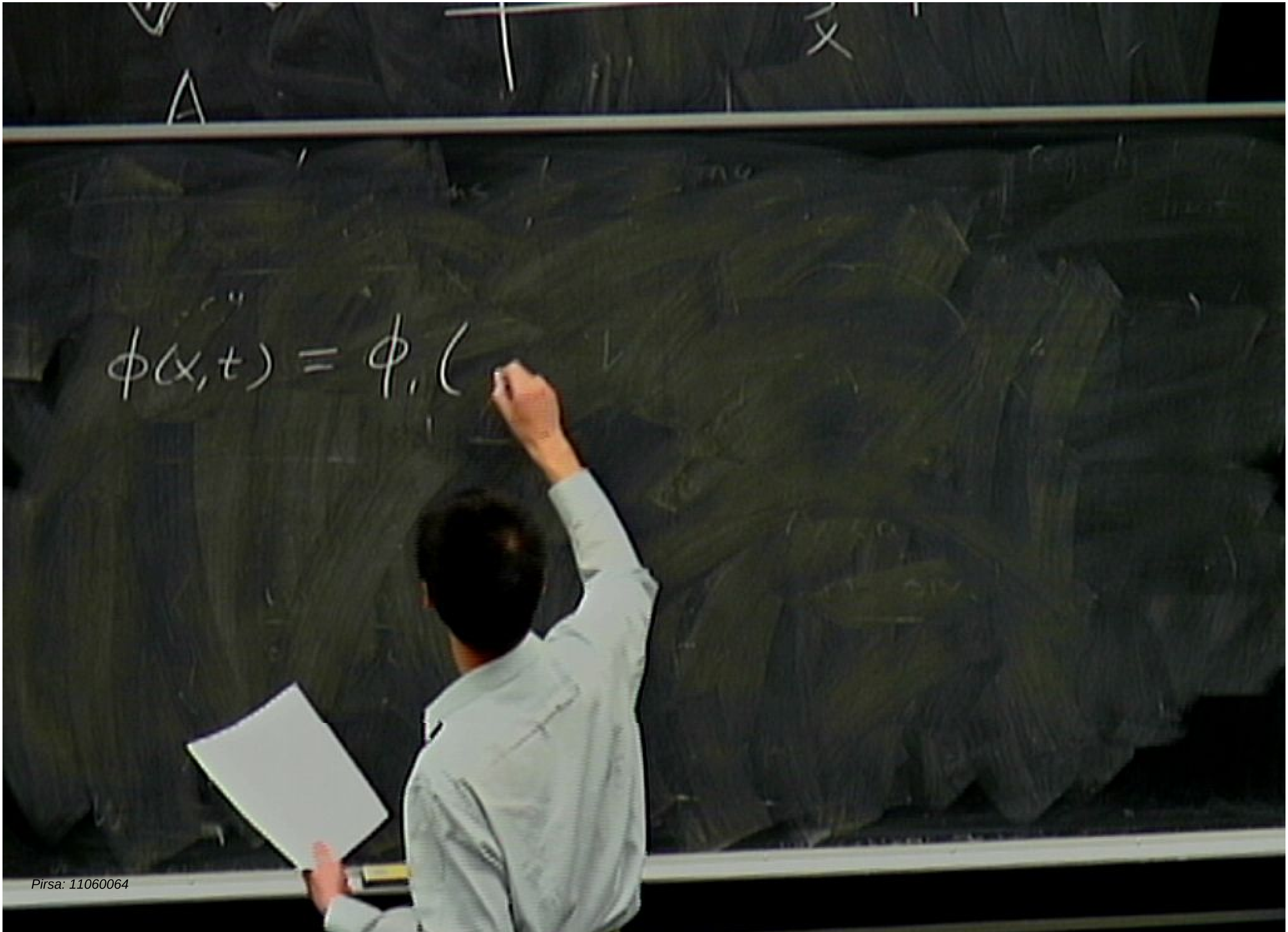
1005.3493 GHLY
1005.3506 J. Y
A
B
C
A
φ
φ_A
φ_B
x
$\ddot{\phi} - \phi'' = -\frac{\partial V}{\partial \phi}$
γ^2
γ^2



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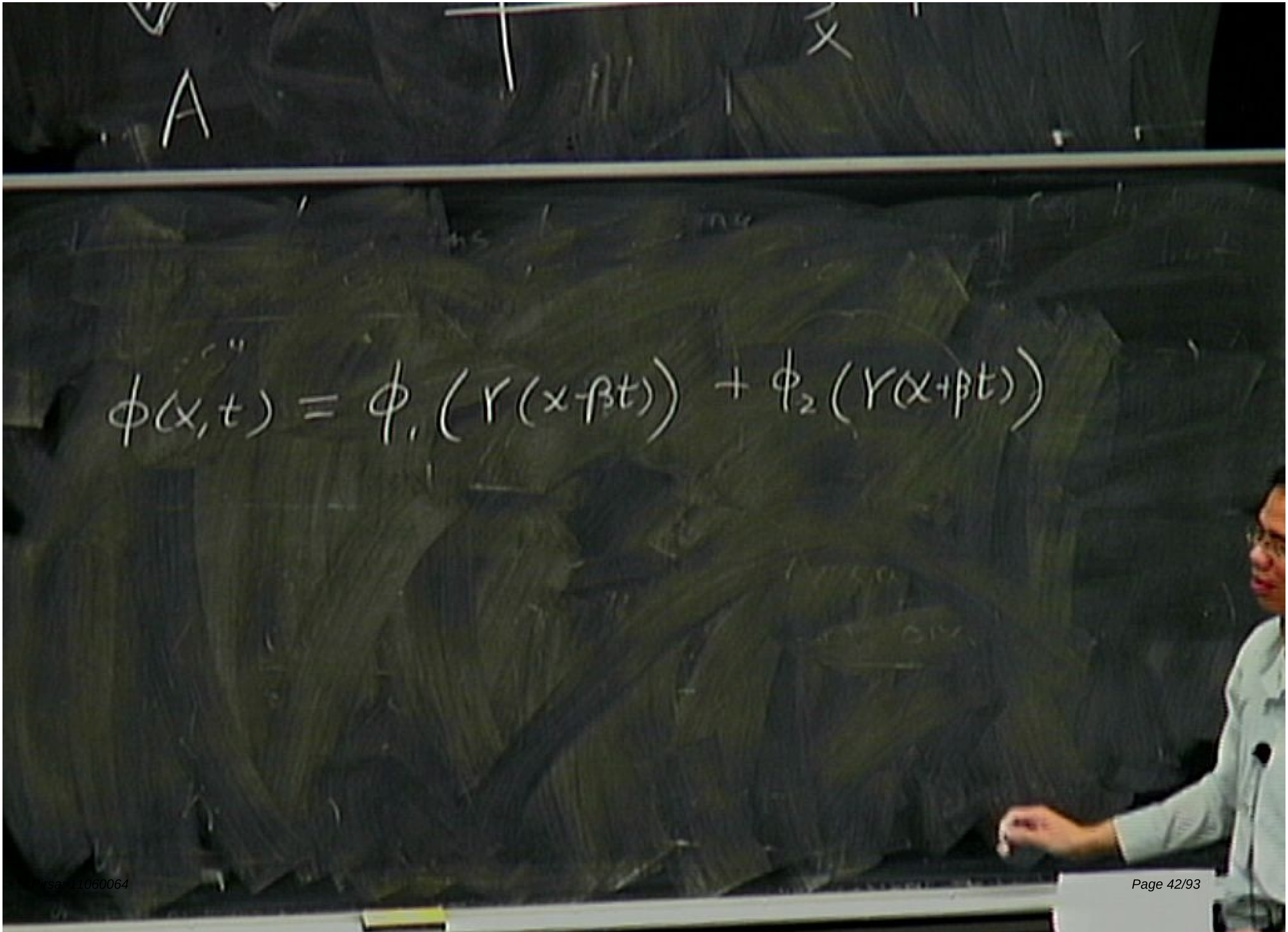
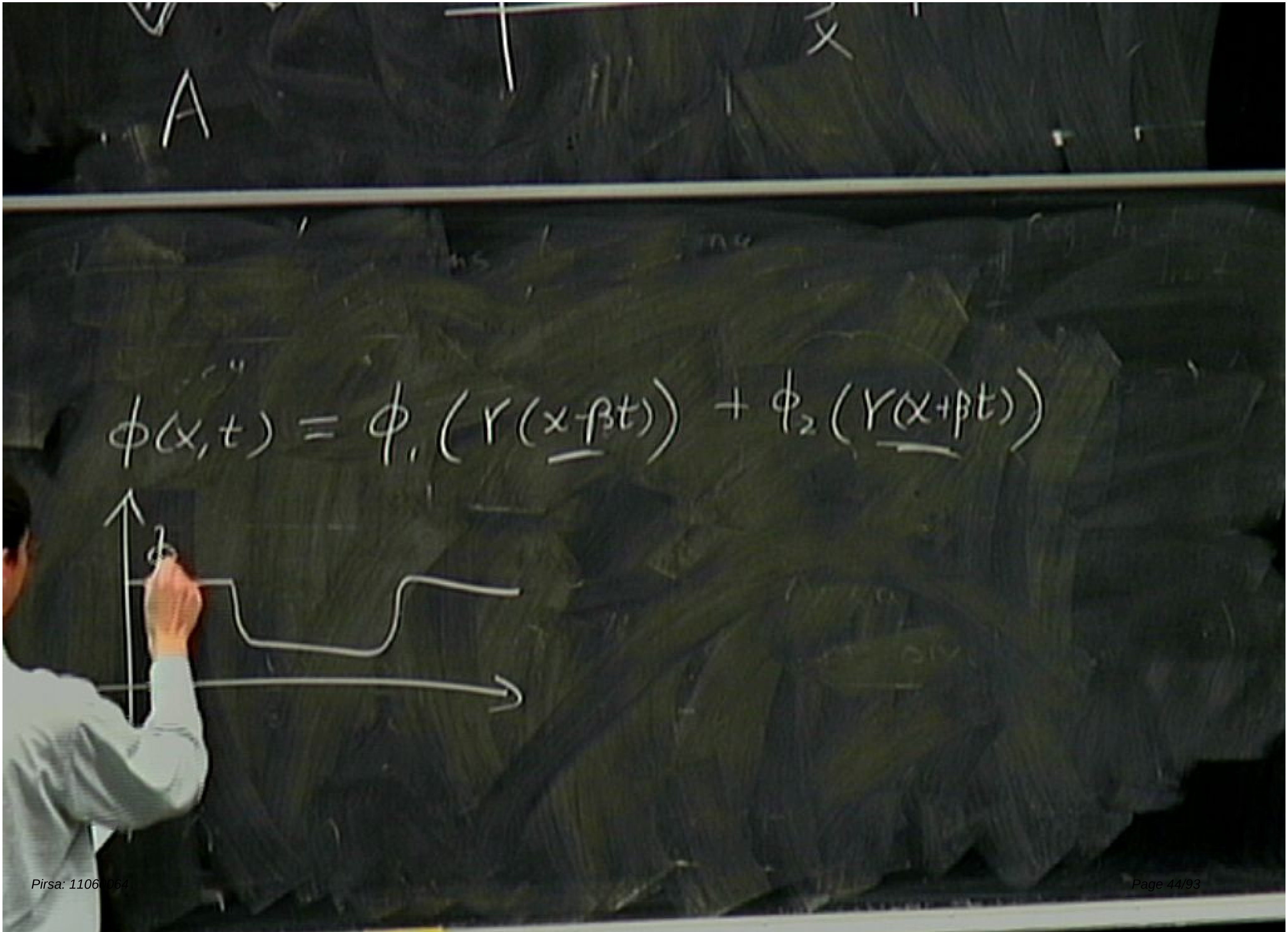
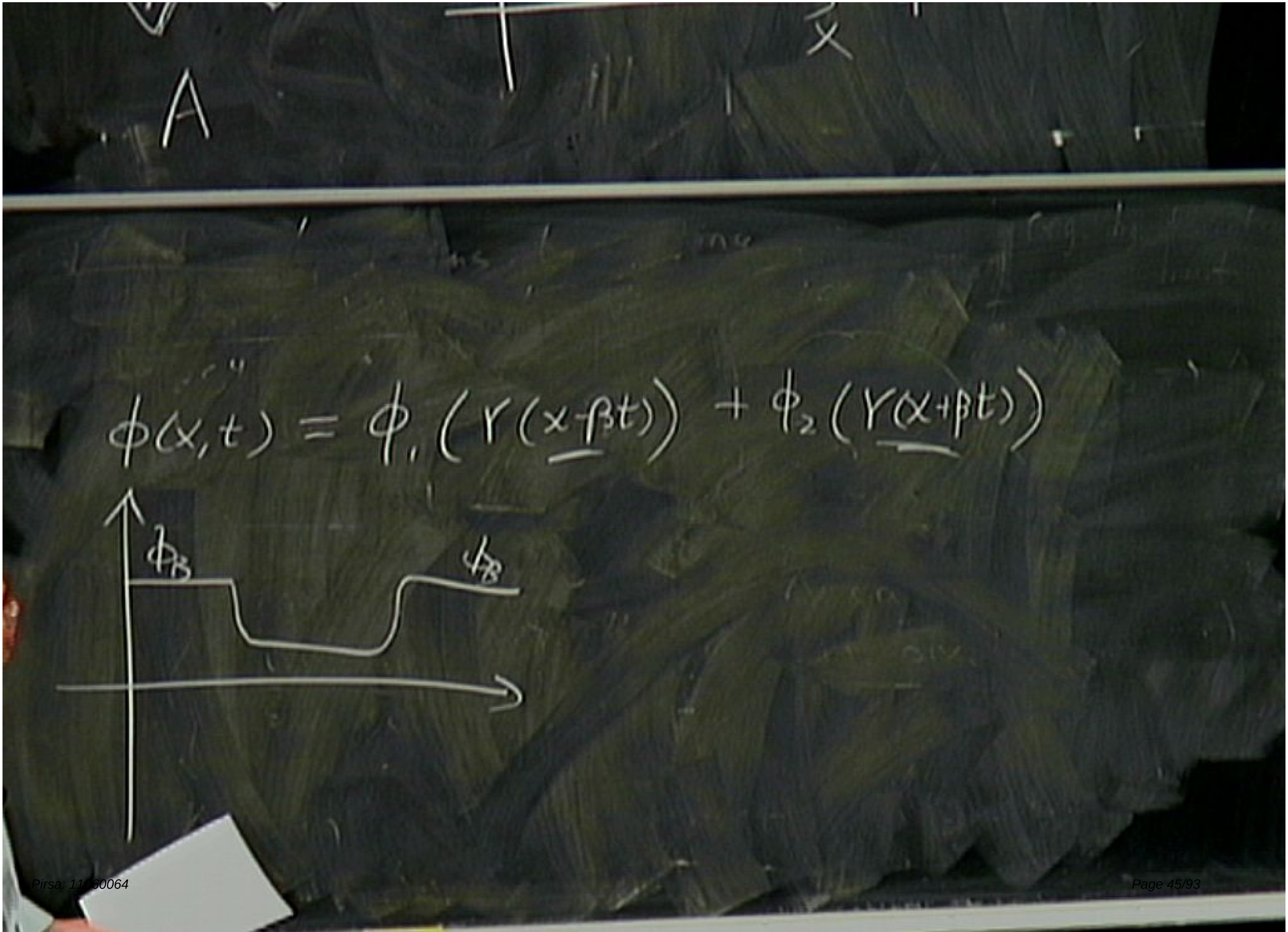
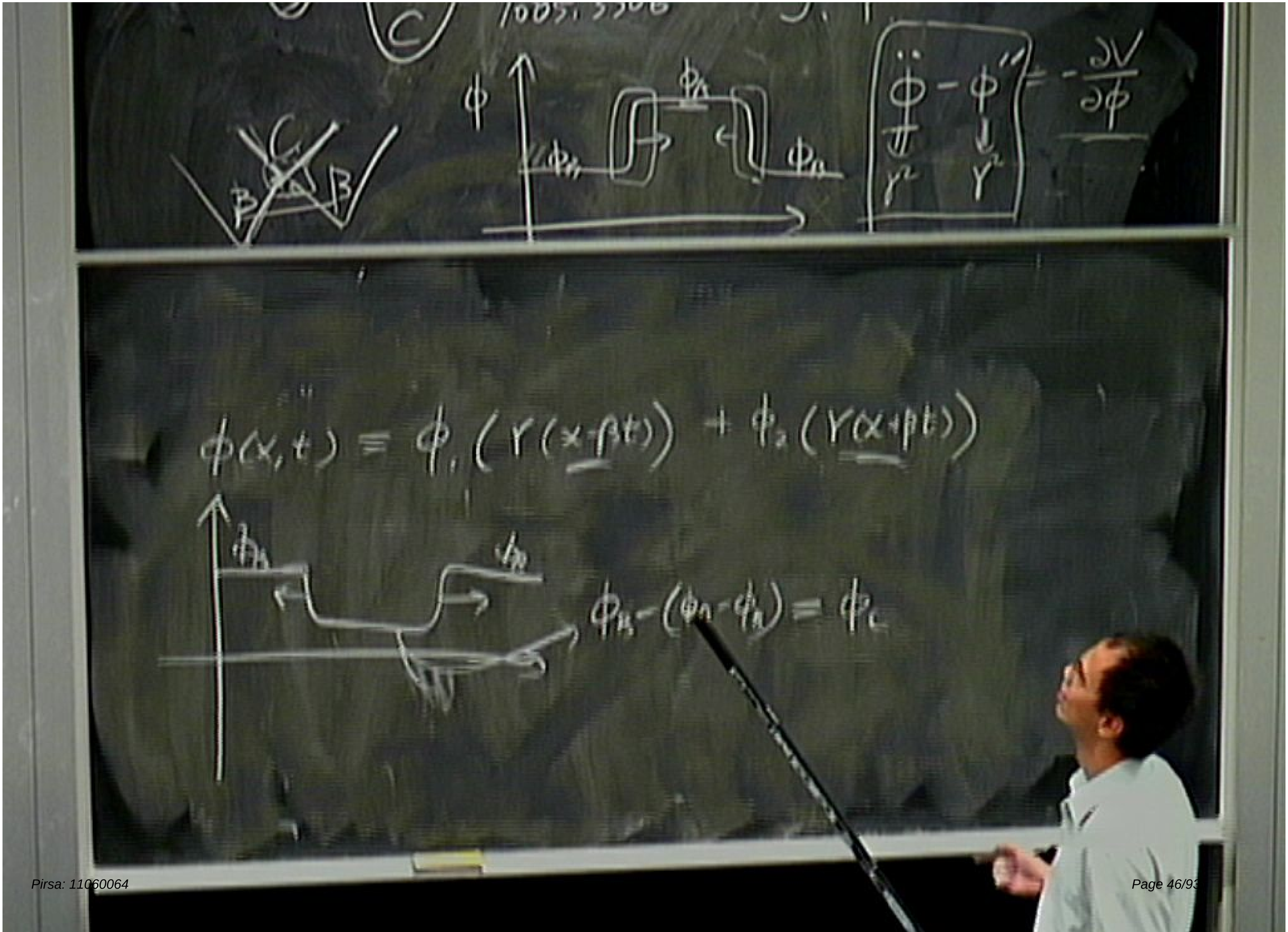

$\phi(x,t) = \phi_1(\gamma(x-\beta t)) + \phi_2(\gamma(x+\beta t))$

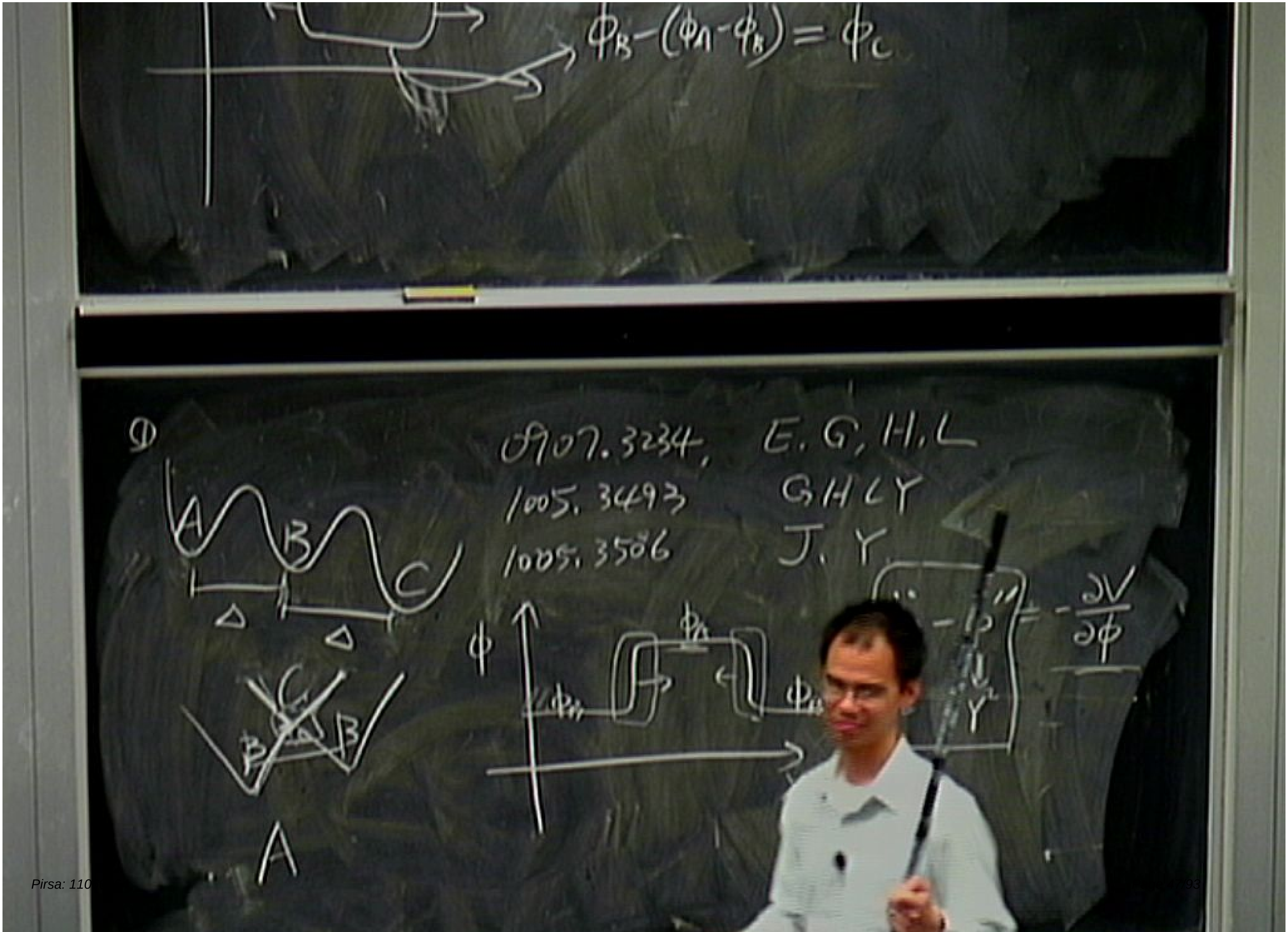
$$\phi(x,t) = \phi_1\left(\gamma(x-\beta t)\right) + \phi_2\left(\gamma(x+\beta t)\right)$$

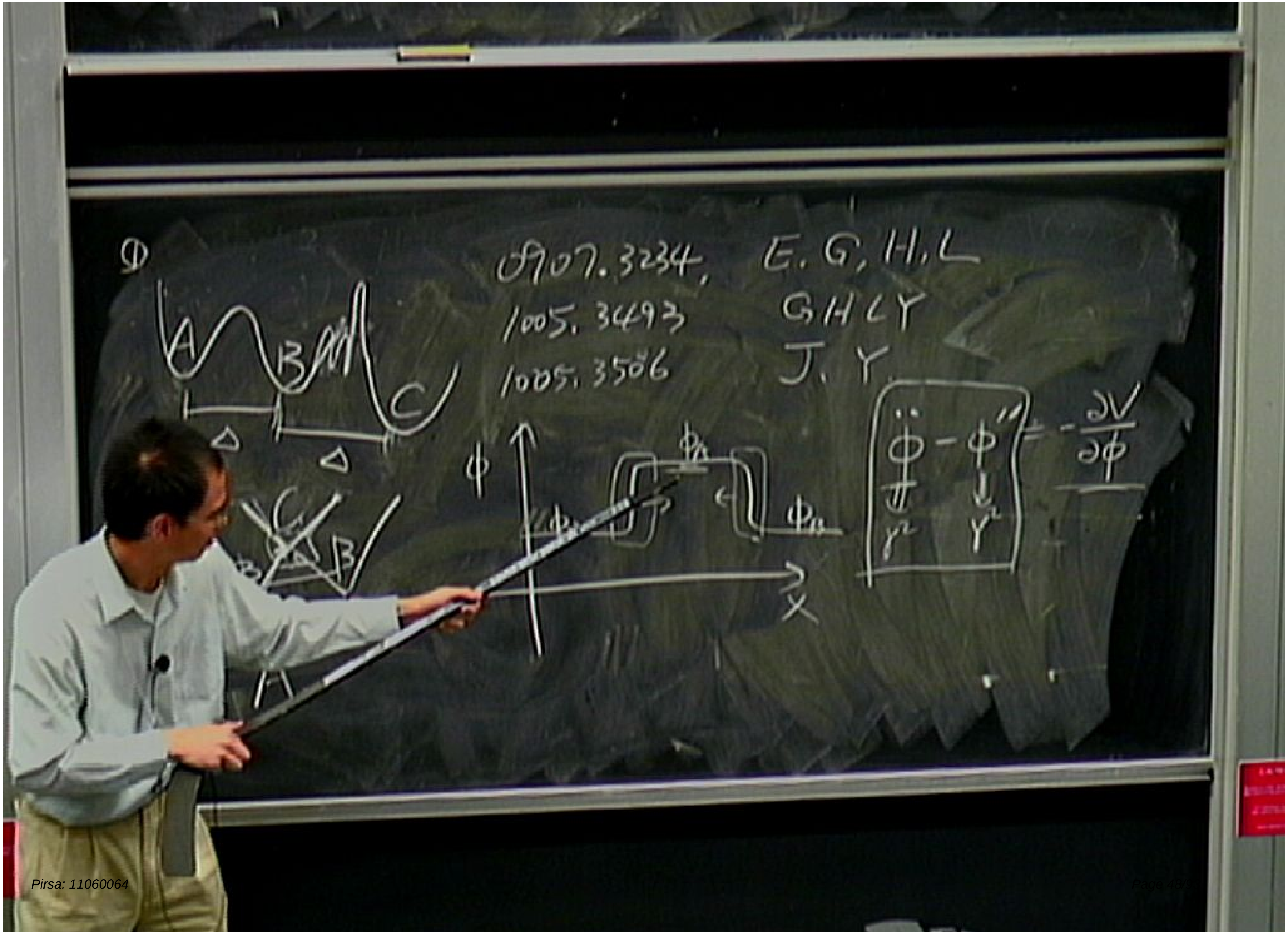


$\phi(x,t) = \phi_1(\gamma(x-\beta t)) + \phi_2(\gamma(x+\beta t))$
A


A
φ(x,t) = φ₁(γ(x−βt)) + φ₂(γ(x+βt))
φ_B
φ_B


φ(x,t) = φ1(γ(x-βt)) + φ2(γ(x+βt))
φB - (φA - φB) = φC


φB − (φA − φB) = φC
0907.3234, E, G, H, L
1005.3493 GHLY
1005.3506 J, Y
A
B
C
φ
−∂V/∂φ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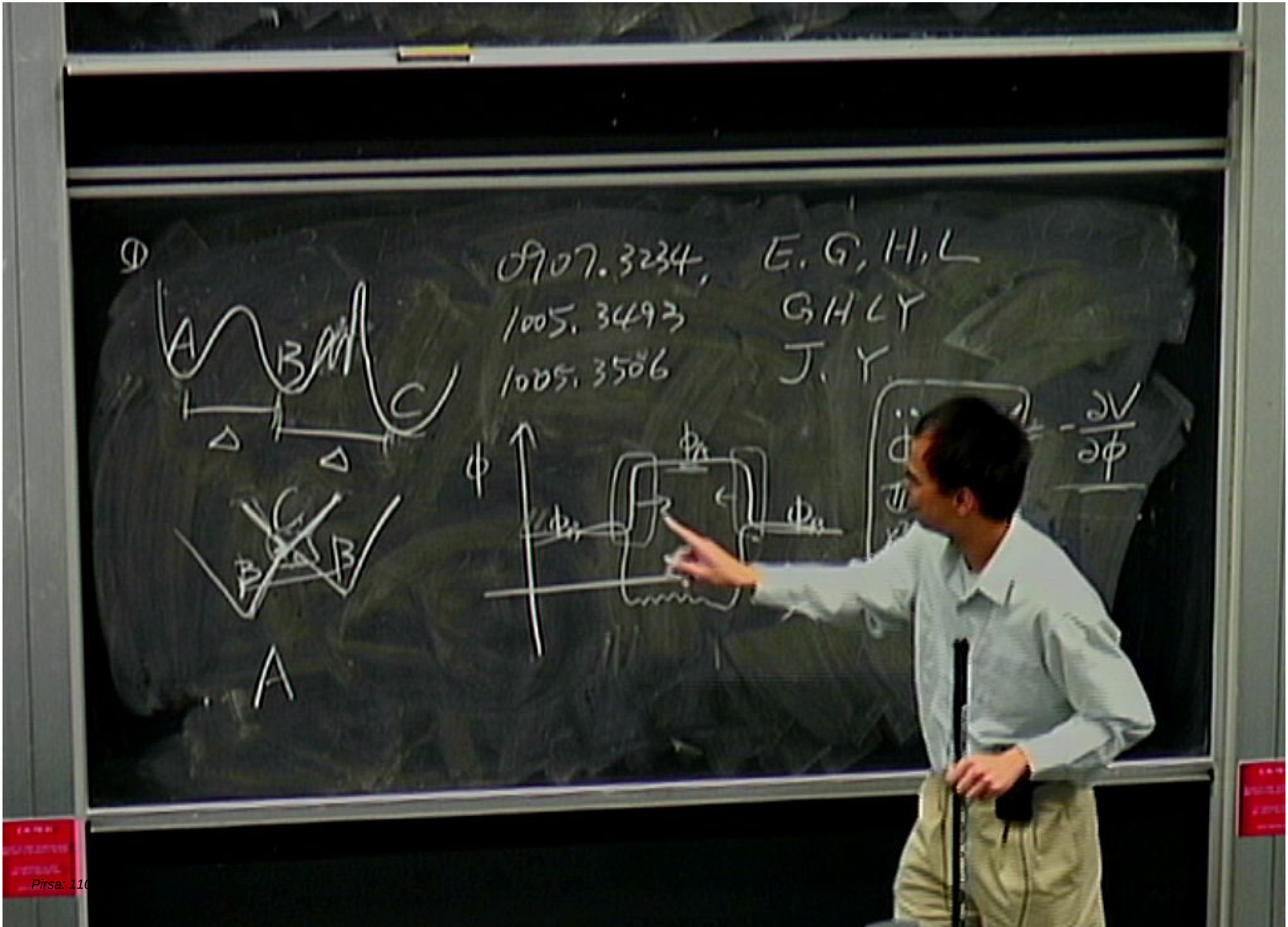
1005.3493 GHLY
1005.3506 J.Y
A
B
C
X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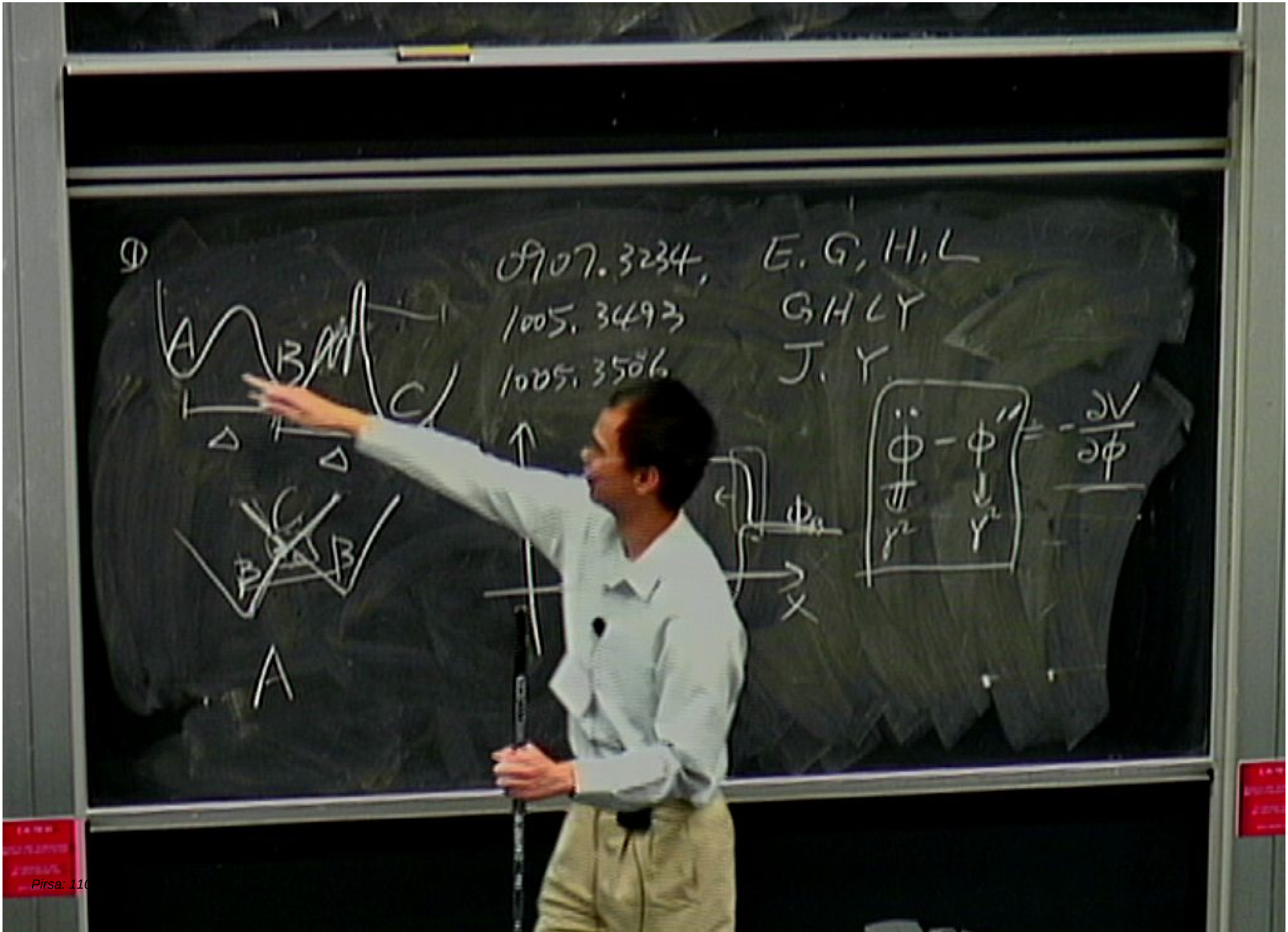
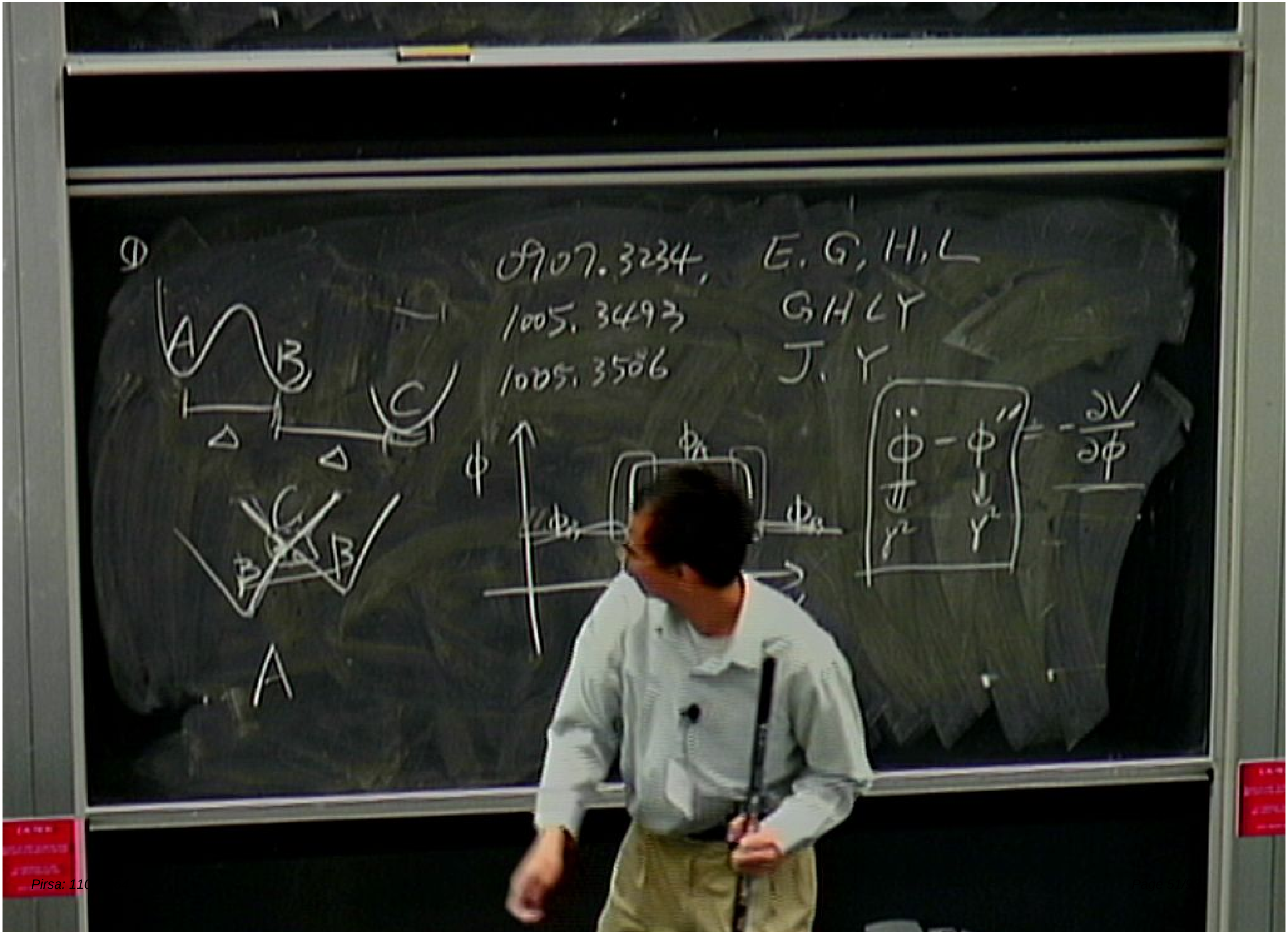
E, G, H, L
1005.3493
G H L Y
1005.3506
J. Y


0907.3234, E. G, H. L
1005.3493 GHLY
1005.3506 J. Y
A
B
C
A
B
B
C
Δ
Δ
x
$\ddot{\phi} - \phi'' = -\frac{\partial V}{\partial \phi}$
Φ_0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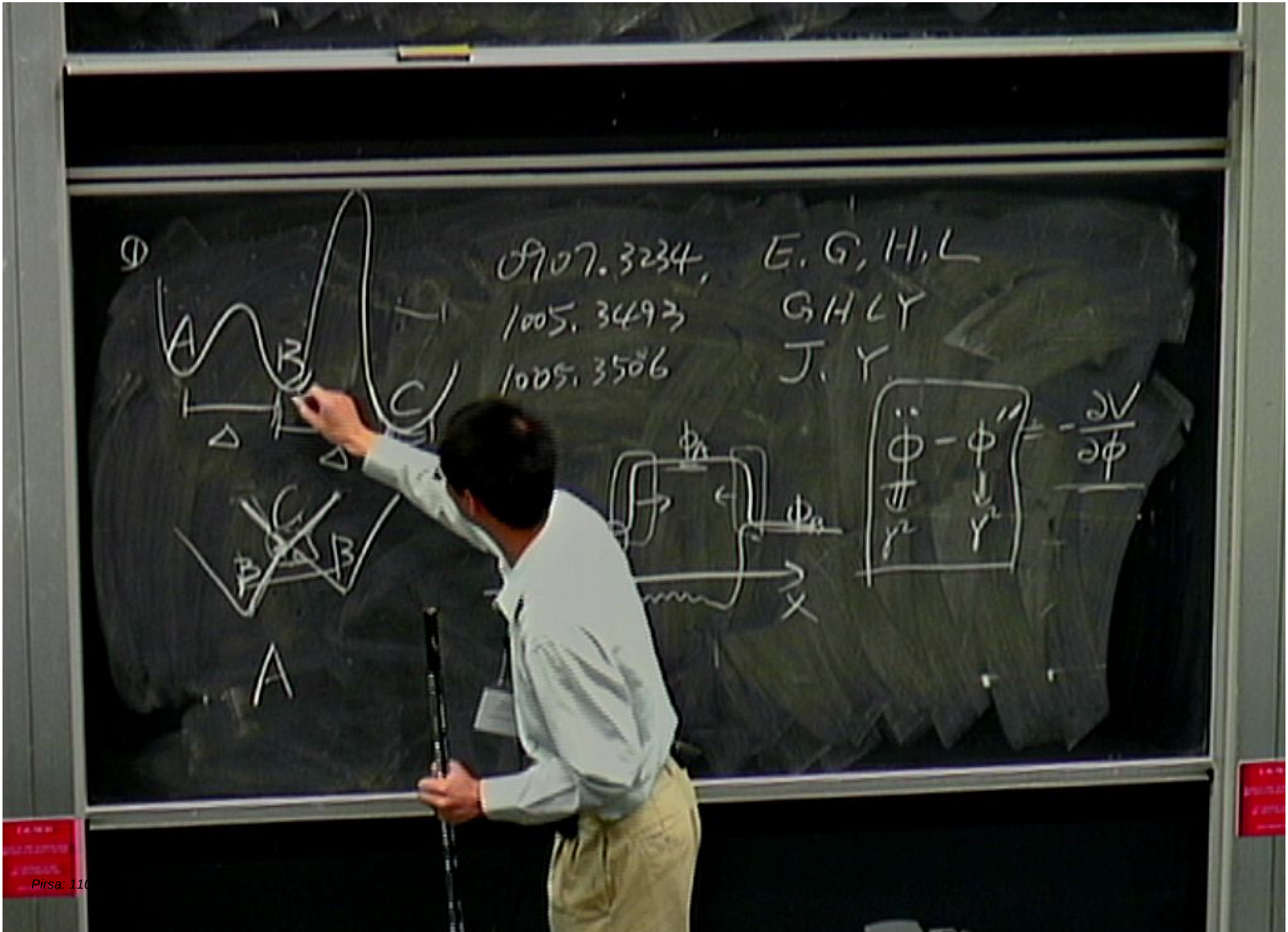
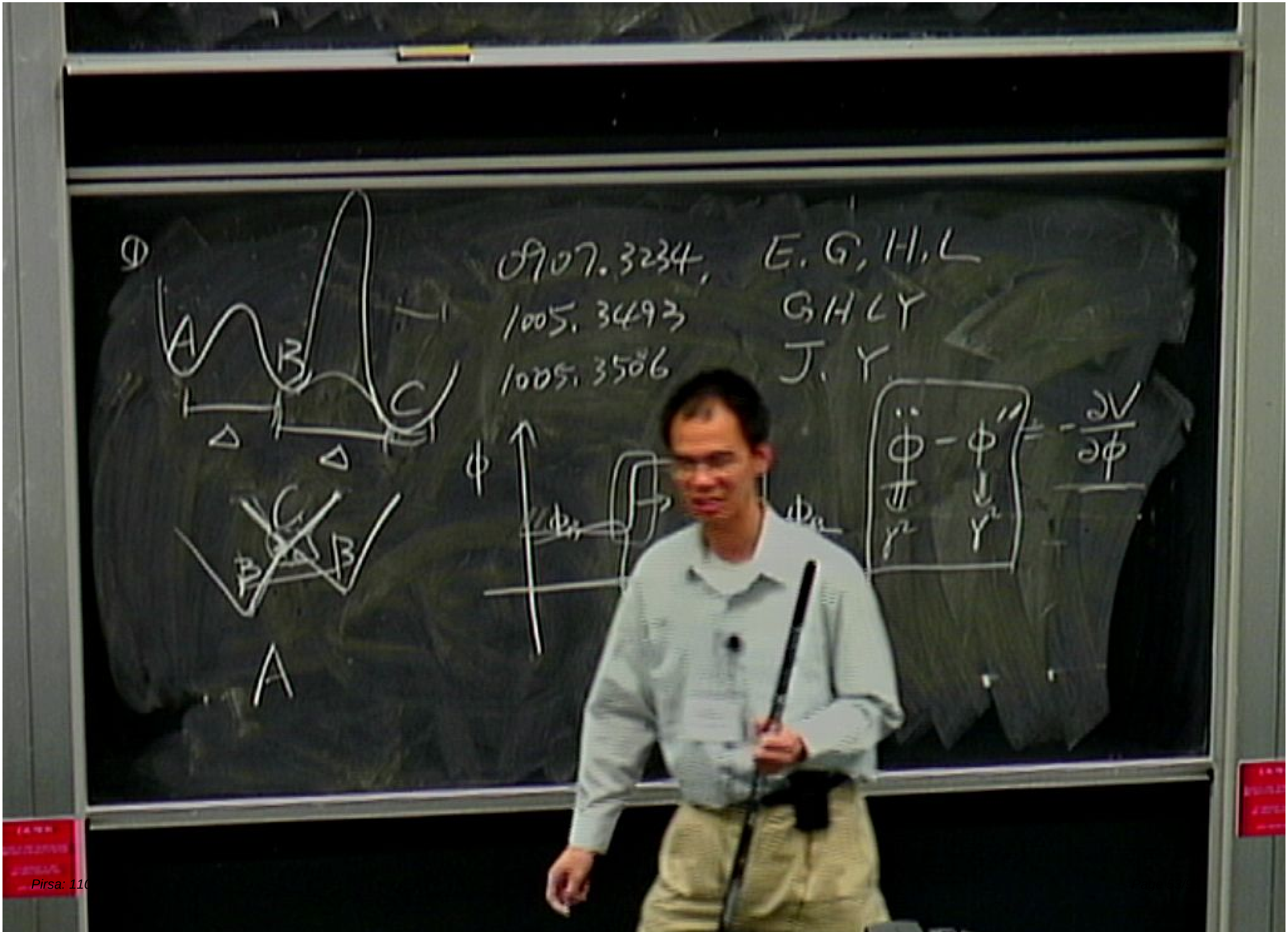
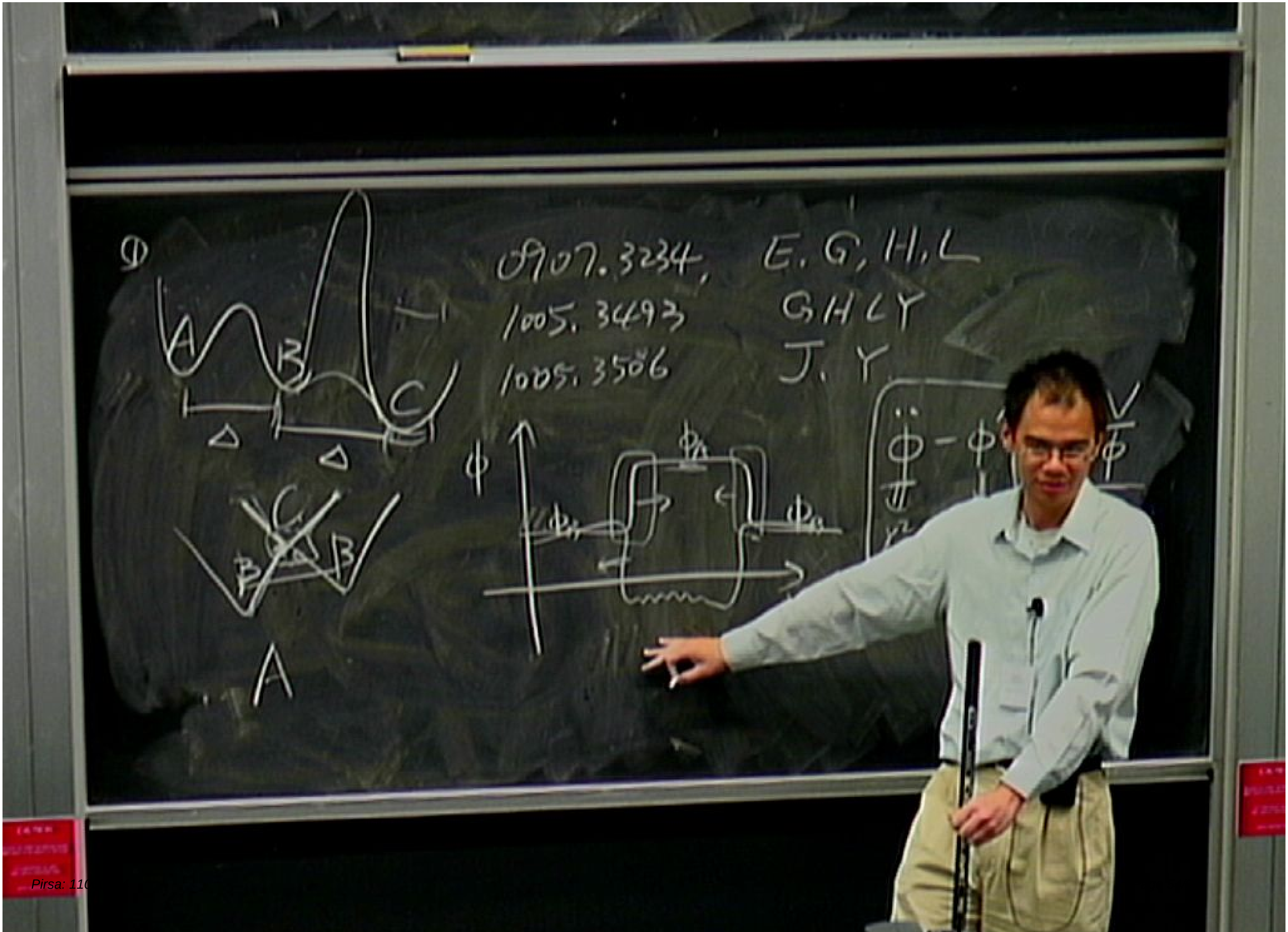
1005.3493 G H L Y
1005.3506 J, Y
A B C
Δ Δ
φ
A



Pirsa: 110



Pirsa: 110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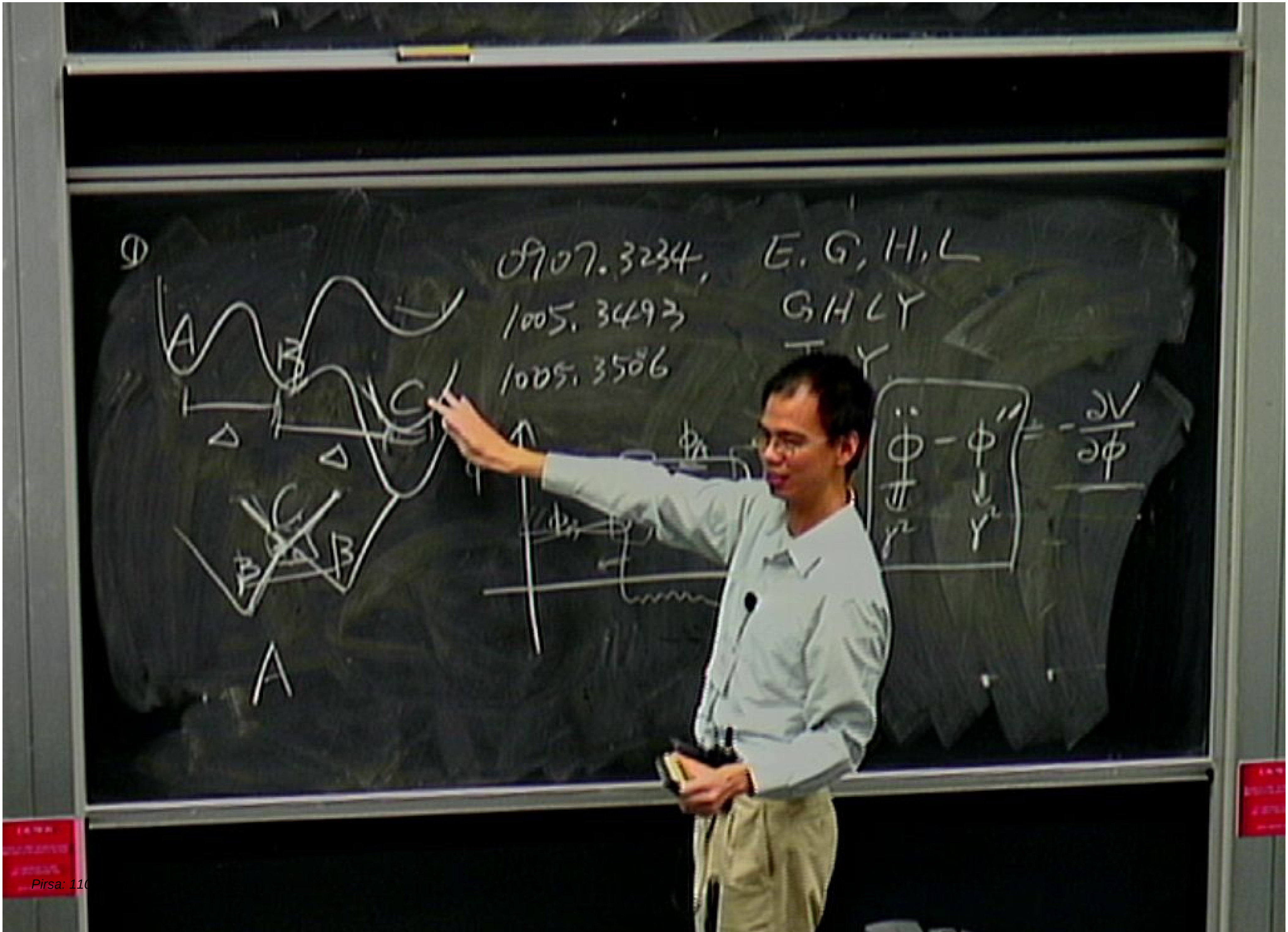
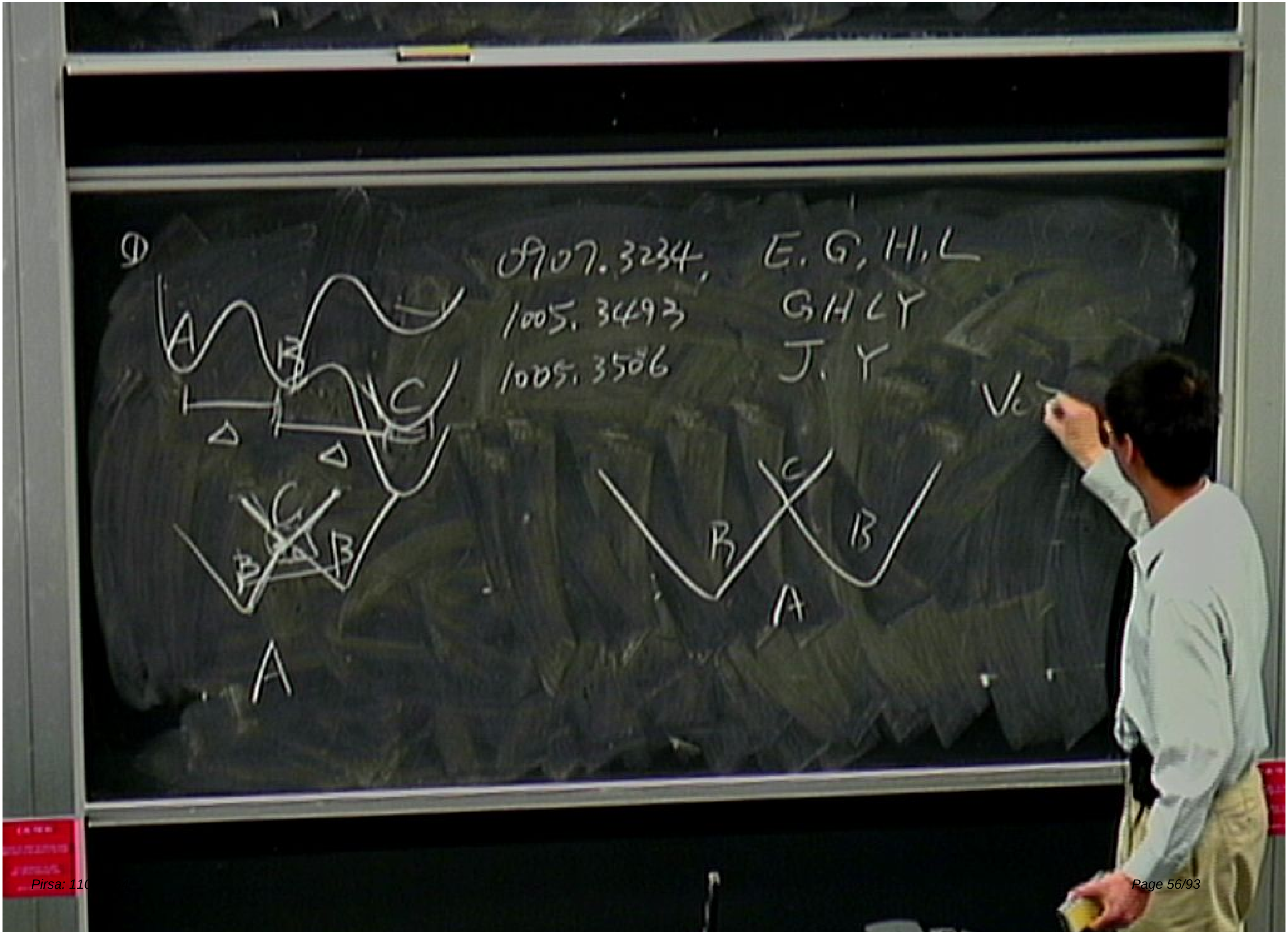
1005.3493 GHLY
1005.3506 J. Y


0907.3234, E, G, H, L
1005.3493 GHLY
1005.3506
A
B
C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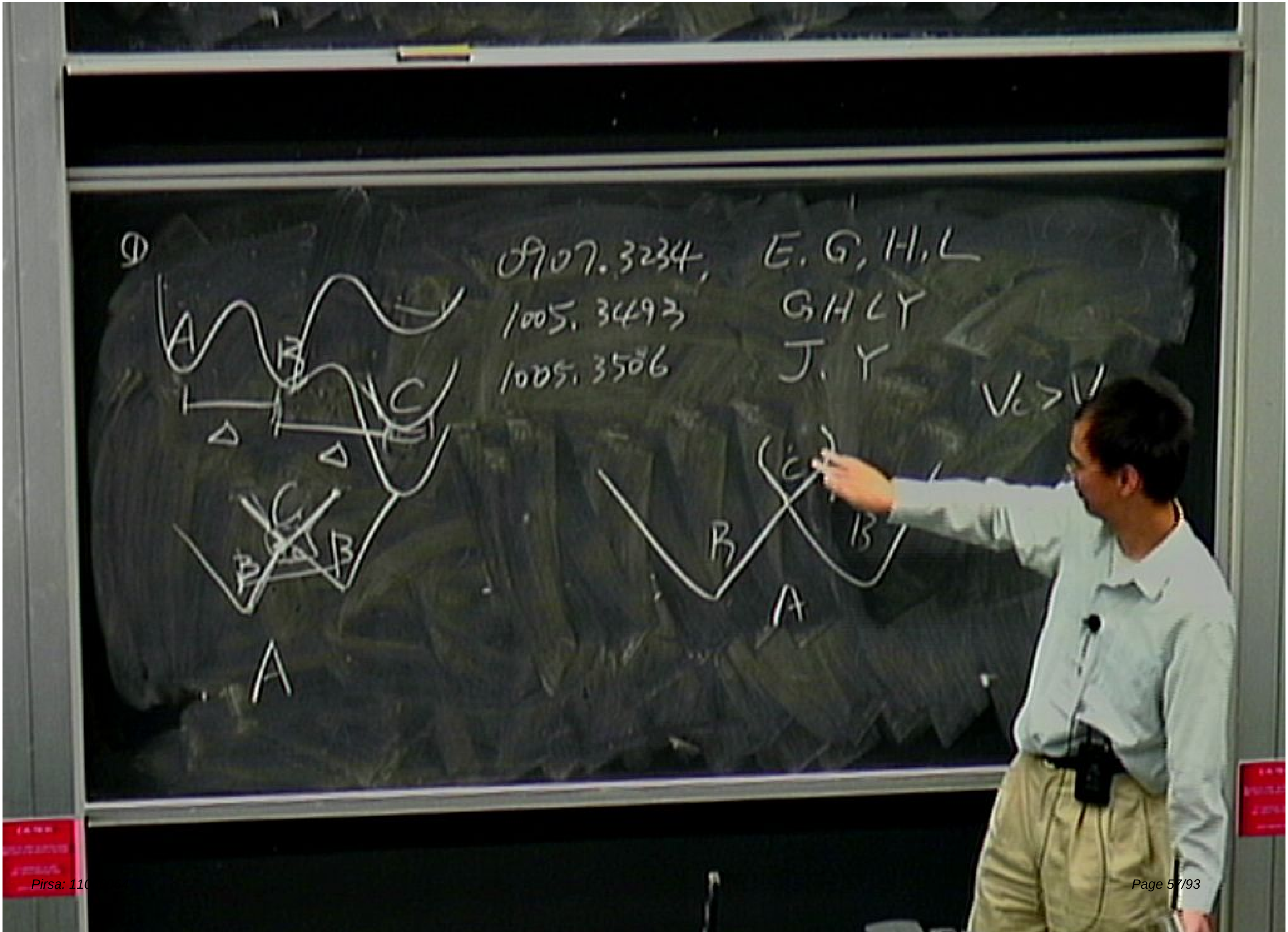
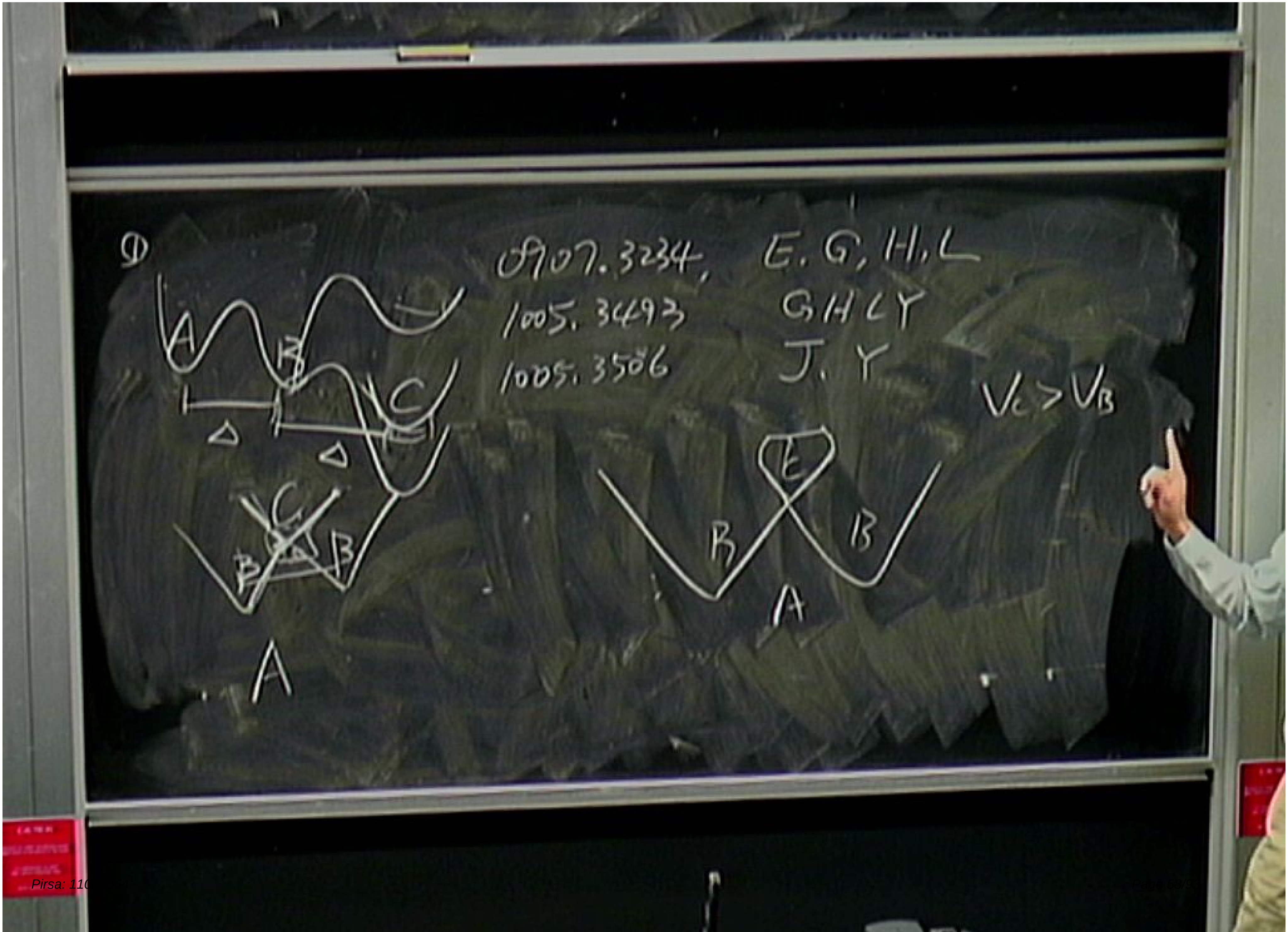
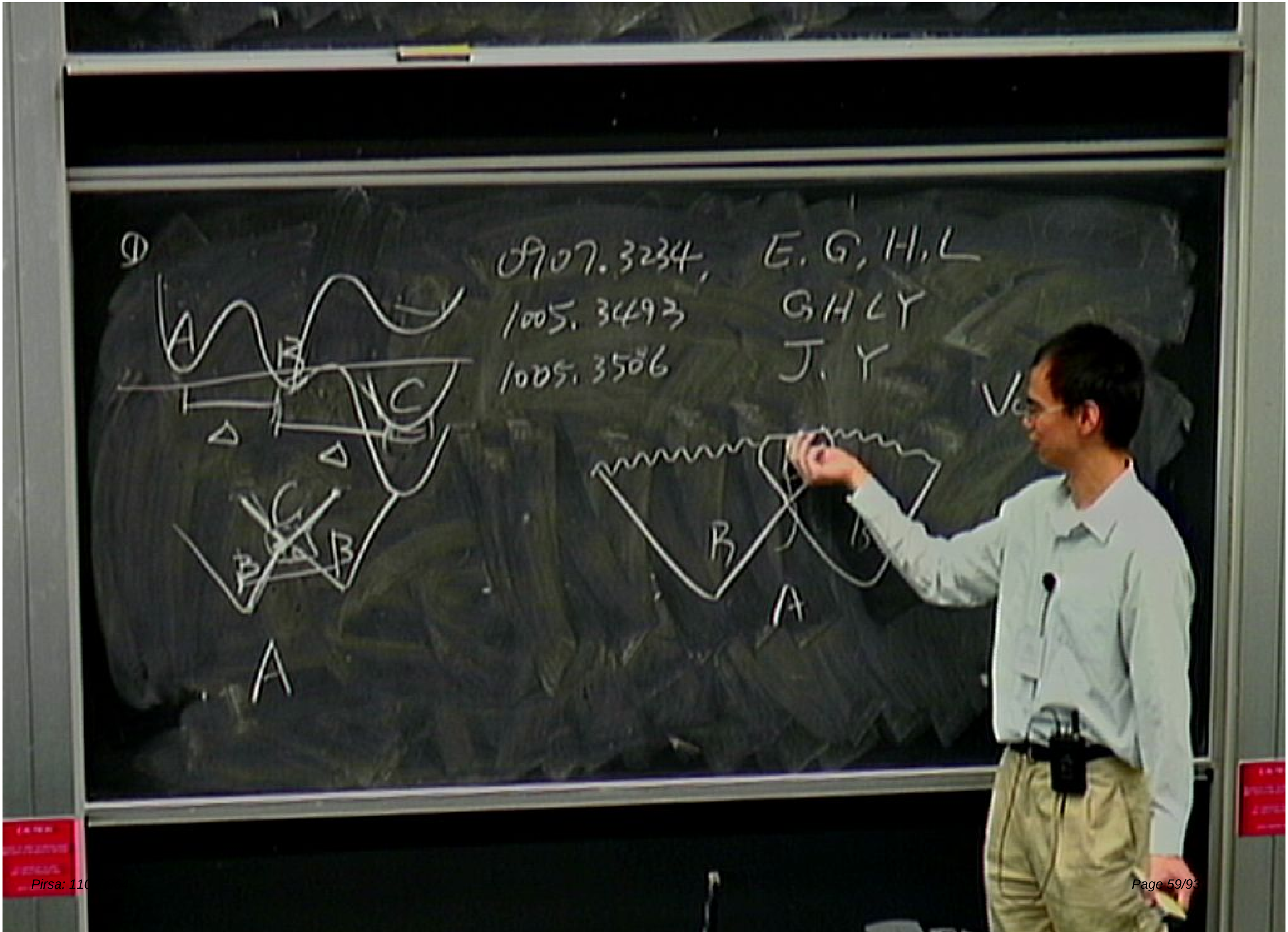
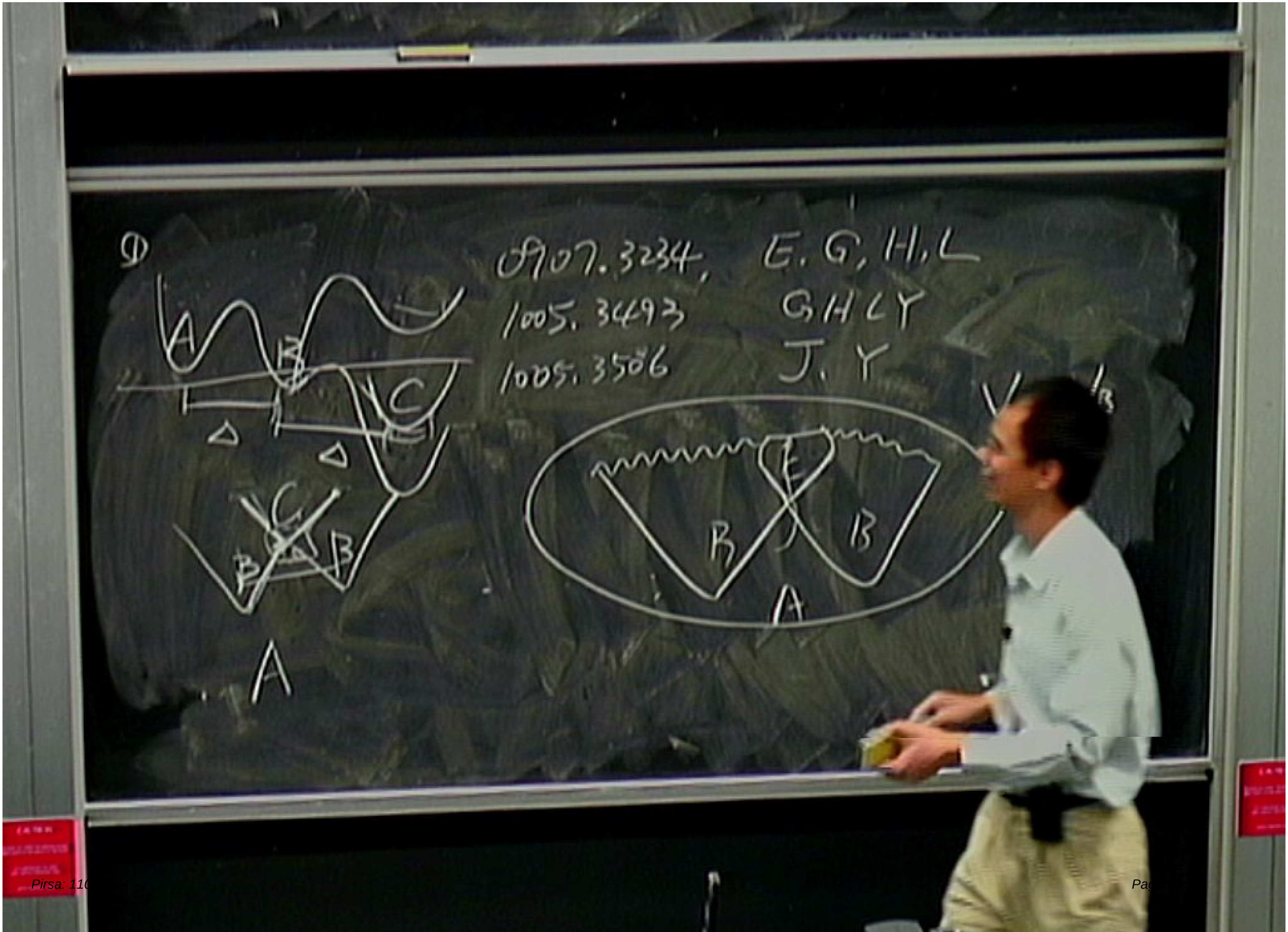
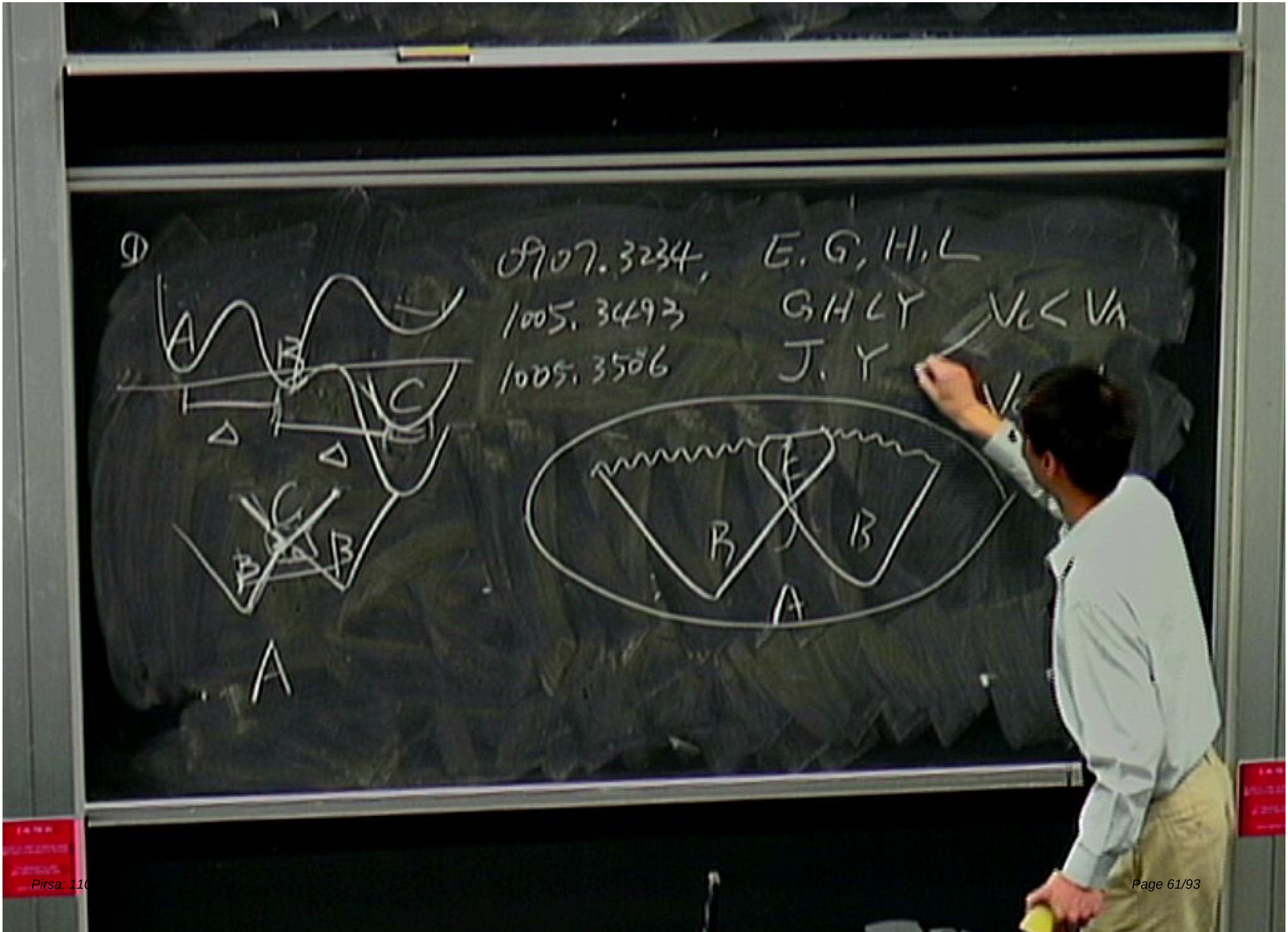
1005.3493 GHLY
1005.3506 J. Y
A
B
C
Δ
Vc


0907.3234, E. G, H, L
1005.3493 G H L Y
1005.3506 J. Y
A
B
C
Δ
A
B
C
B
A
B
C
B
A
$V_c > V$


0907.3234, E, G, H, L
1005.3493 GHLY
1005.3506 J, Y
Vc > VB


0907.3234, E. G, H. L
1005.3493 GHLY
1005.3586 J. Y
A
B
C
A
B
B
C
A
B
B
A


0907.3234, E. G, H, L
1005.3493 GHLY
1005.3506 J. Y
A
B
C
Δ
E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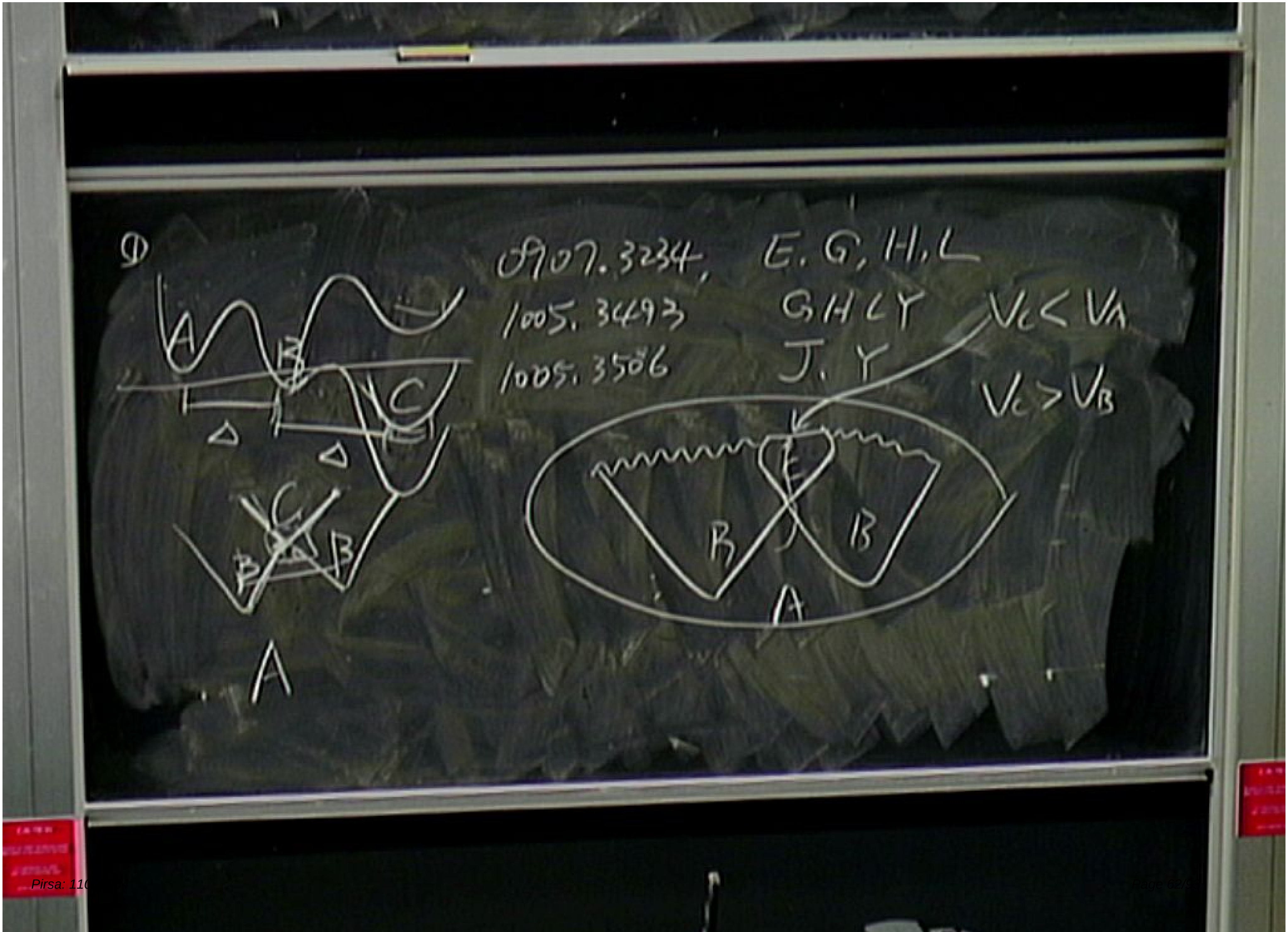
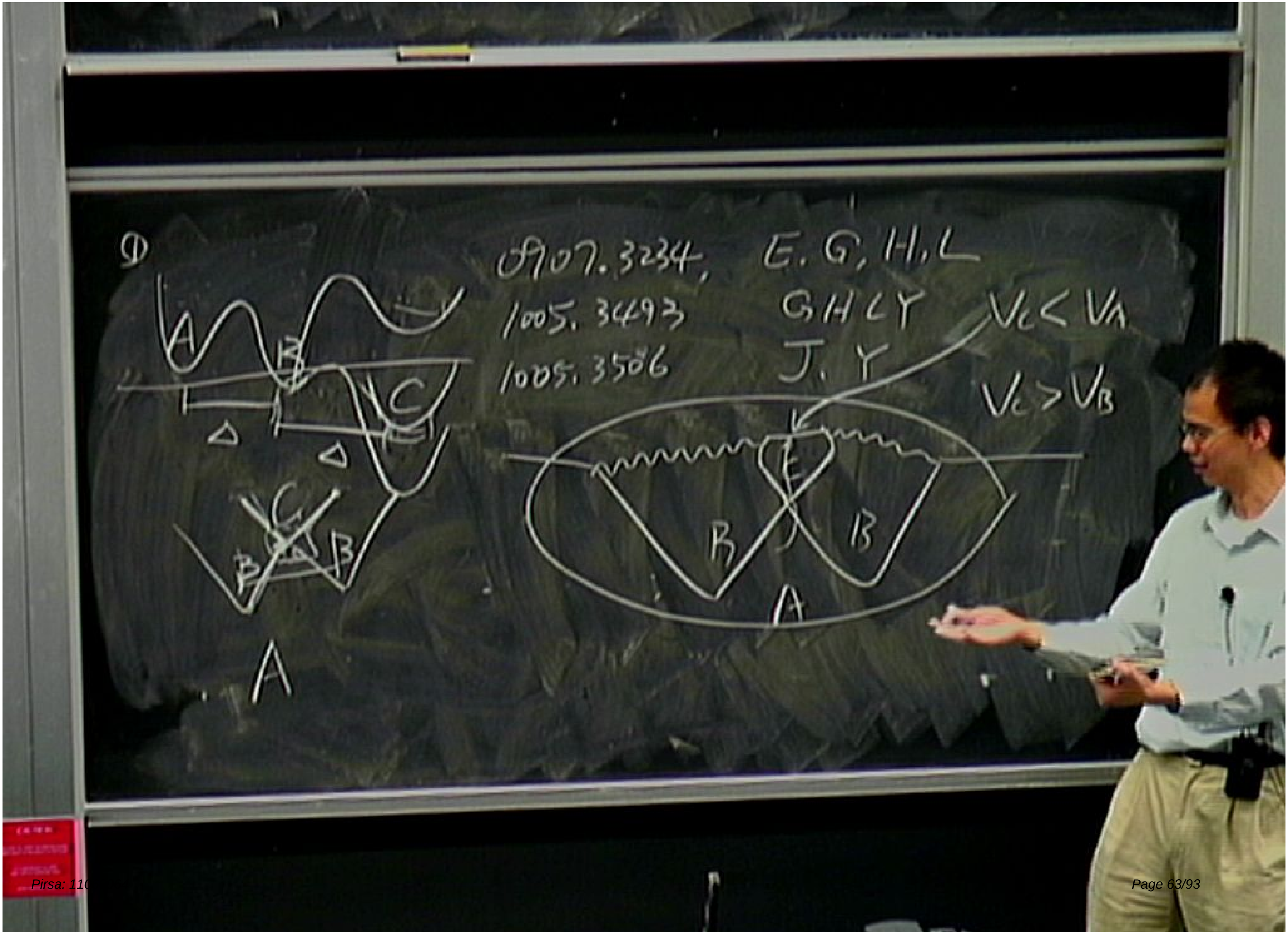
1005.3493 G H L Y
1005.3506 J. Y
$V_C < V_A$


①
0907.3234, E, G, H, L
1005.3493 G H L Y
1005.3506 J. Y
$V_C < V_A$
$V_C > V_B$
A
B
C
Δ
E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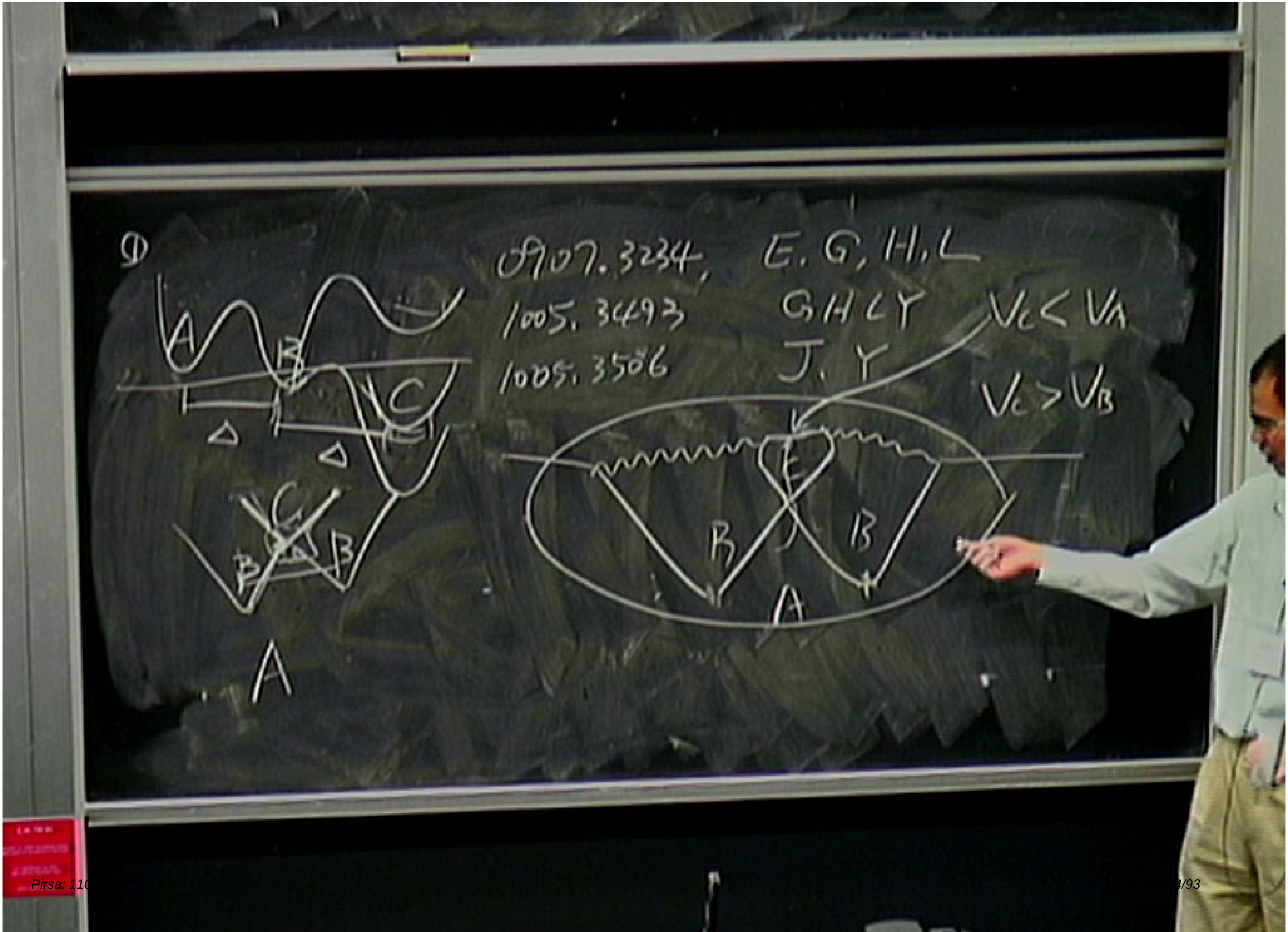
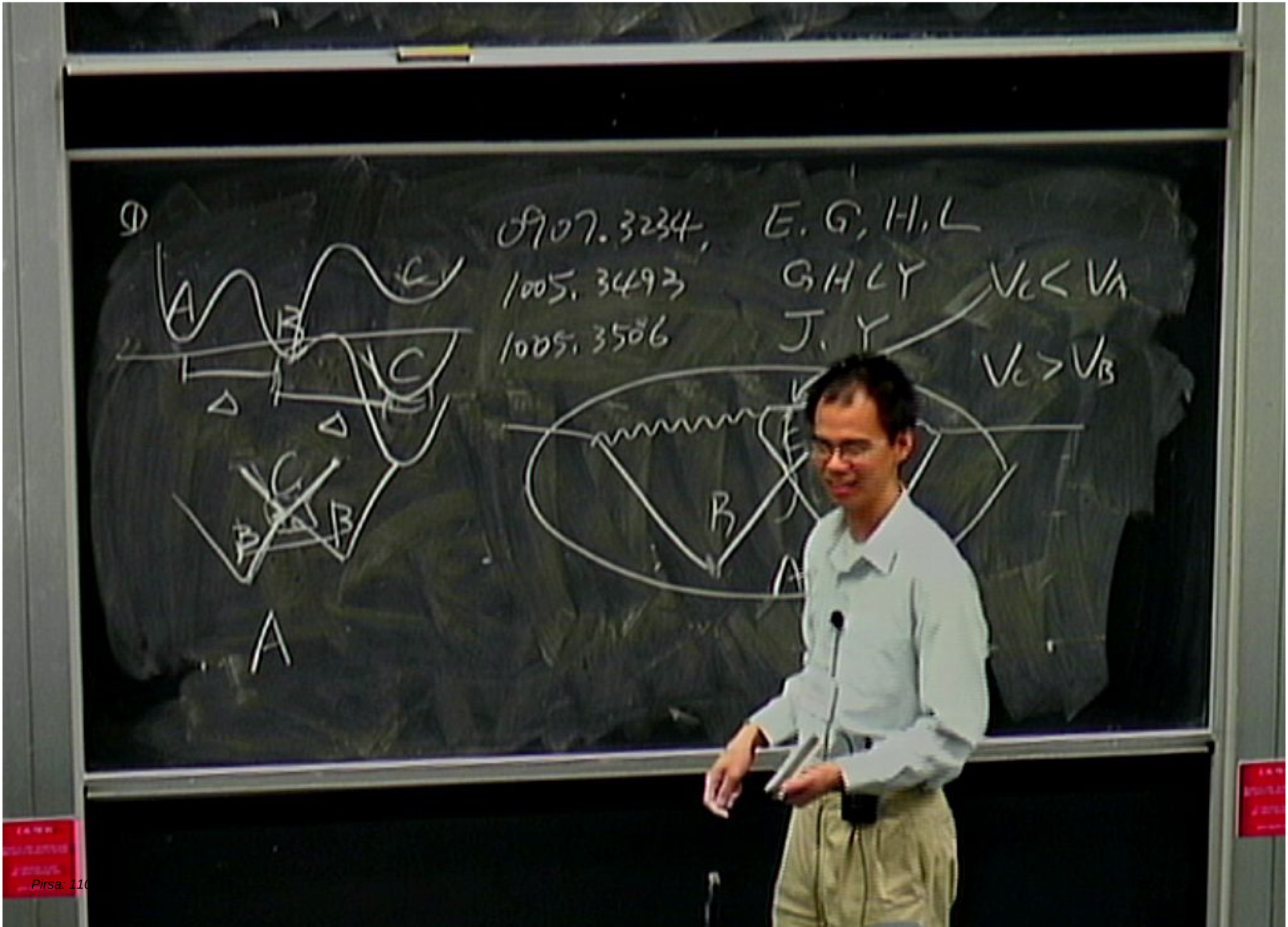
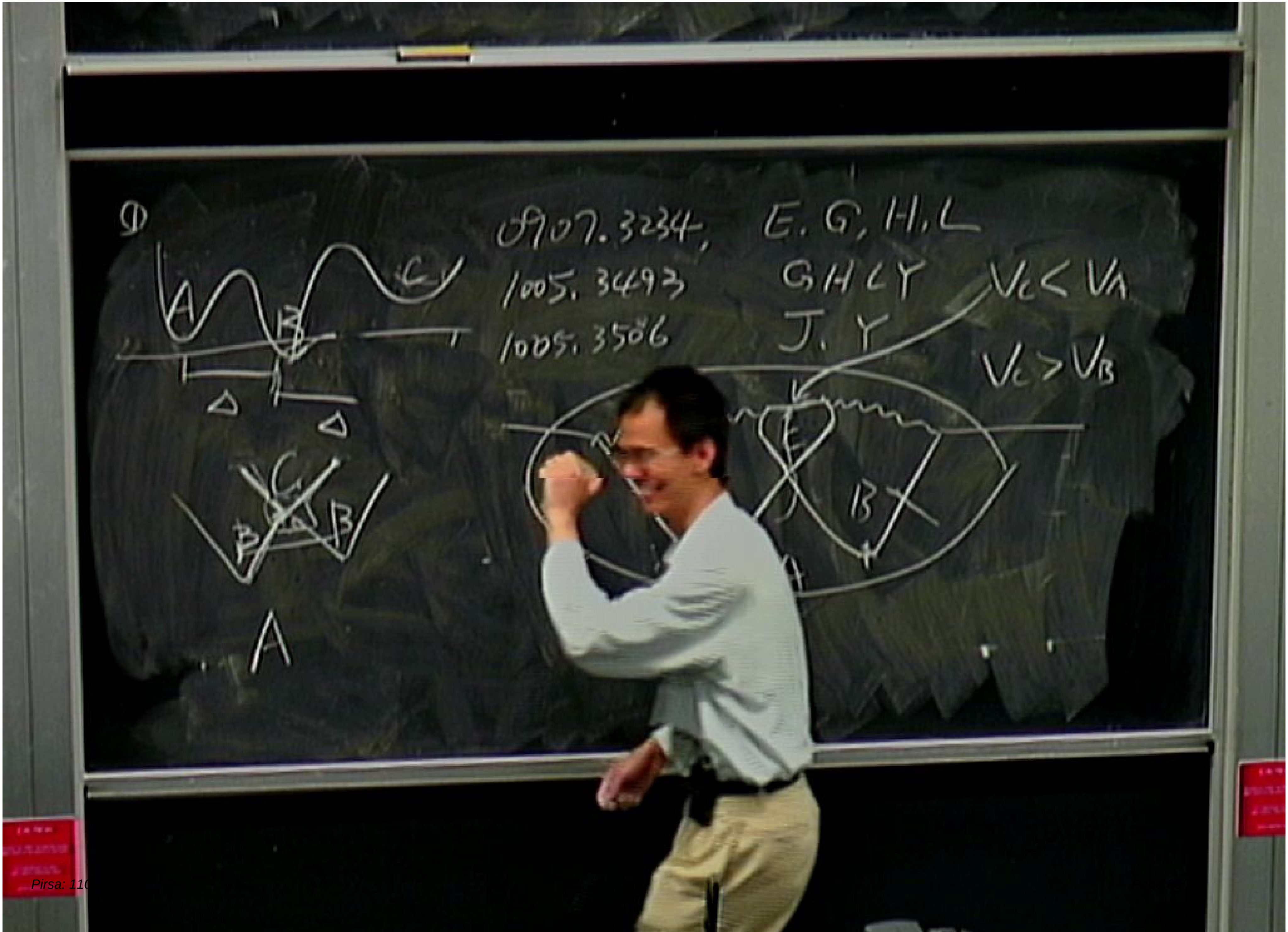
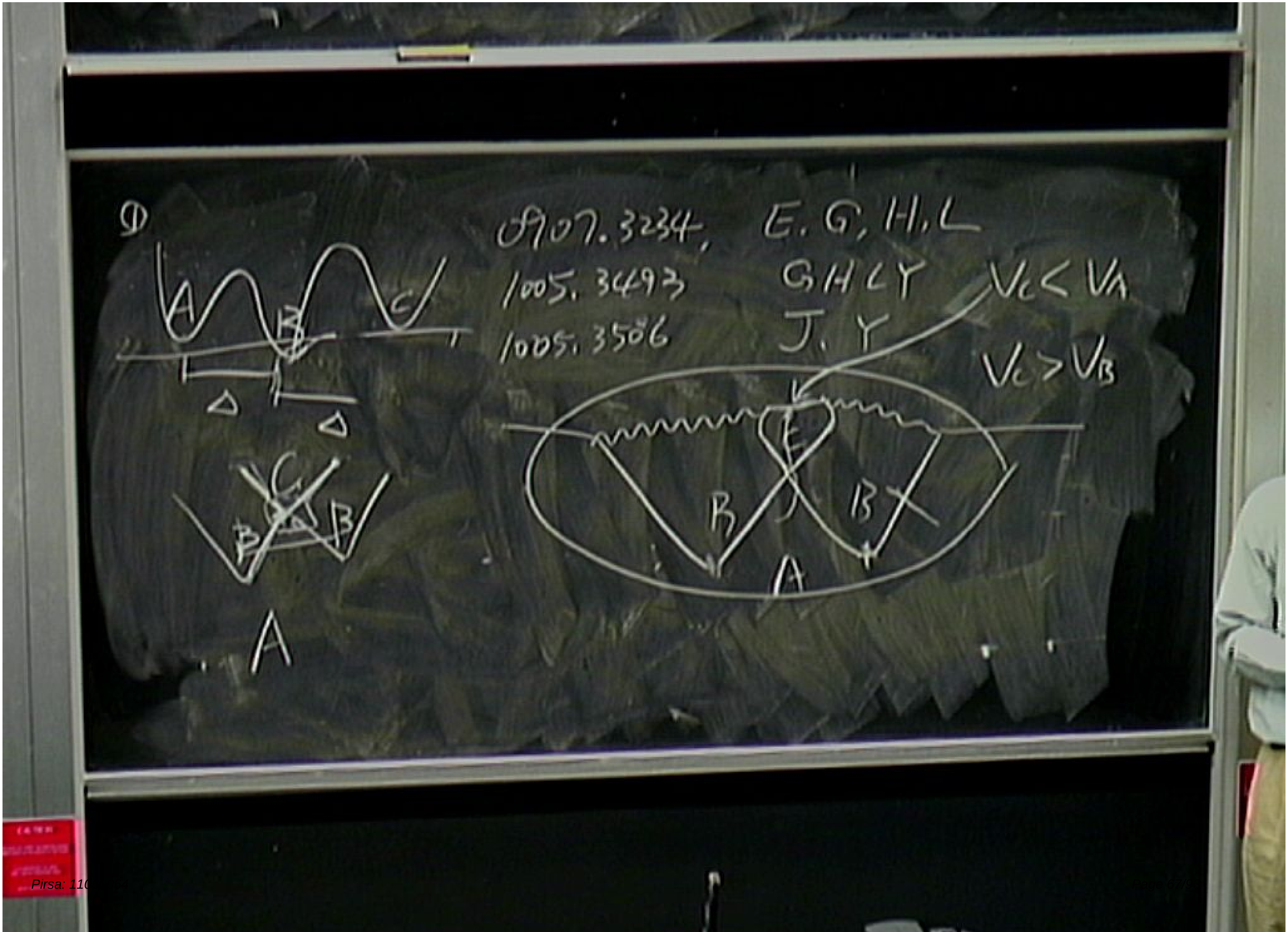
1005.3493 GHLY
1005.3506 J. Y
Vc < VA
Vc > VB
A
B
C
E

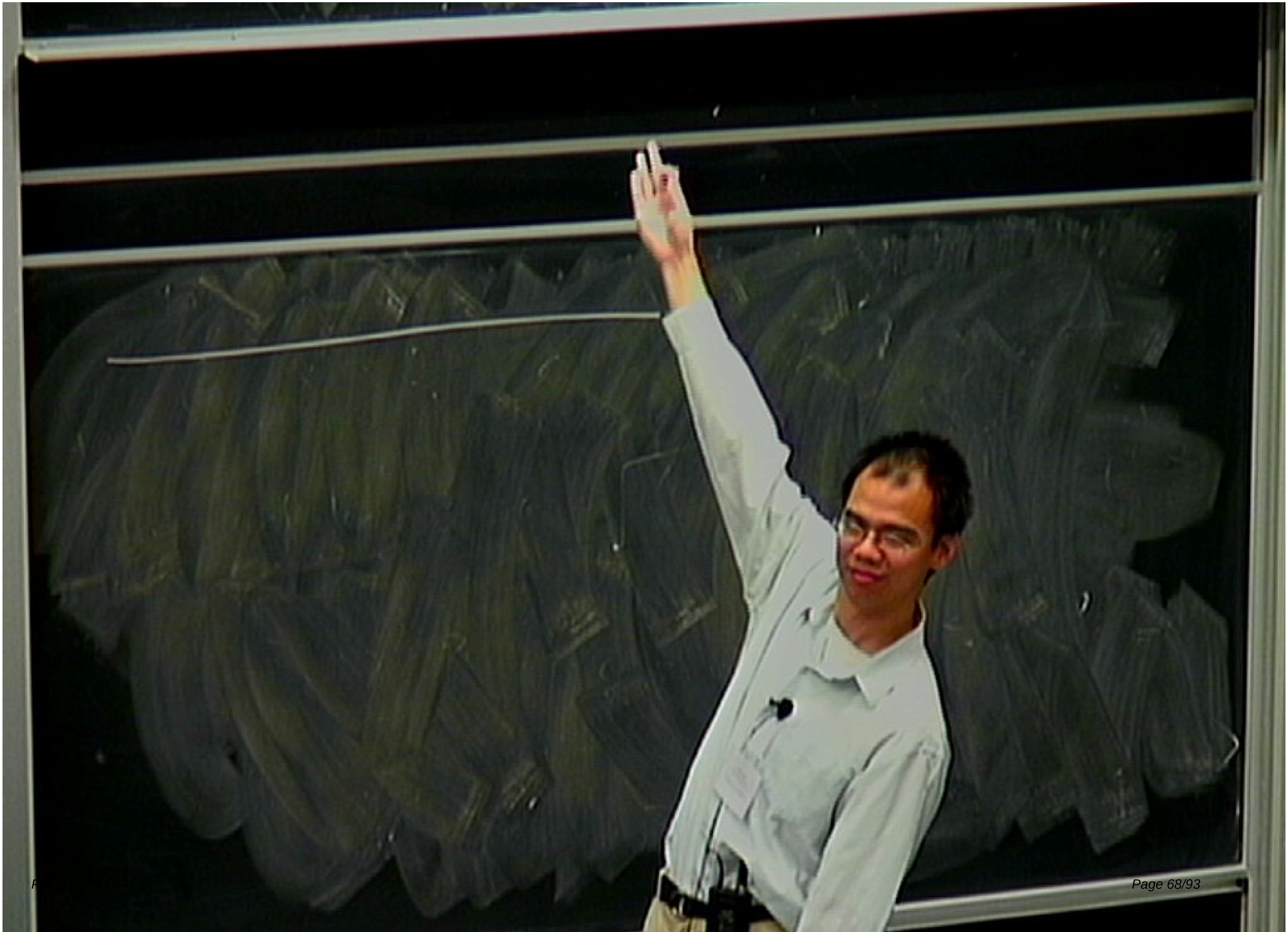

0907.3234, E, G, H, L
1005.3493 G H L Y
1005.3506 J. Y
Vc < VA
Vc > VB
A
B
C
E

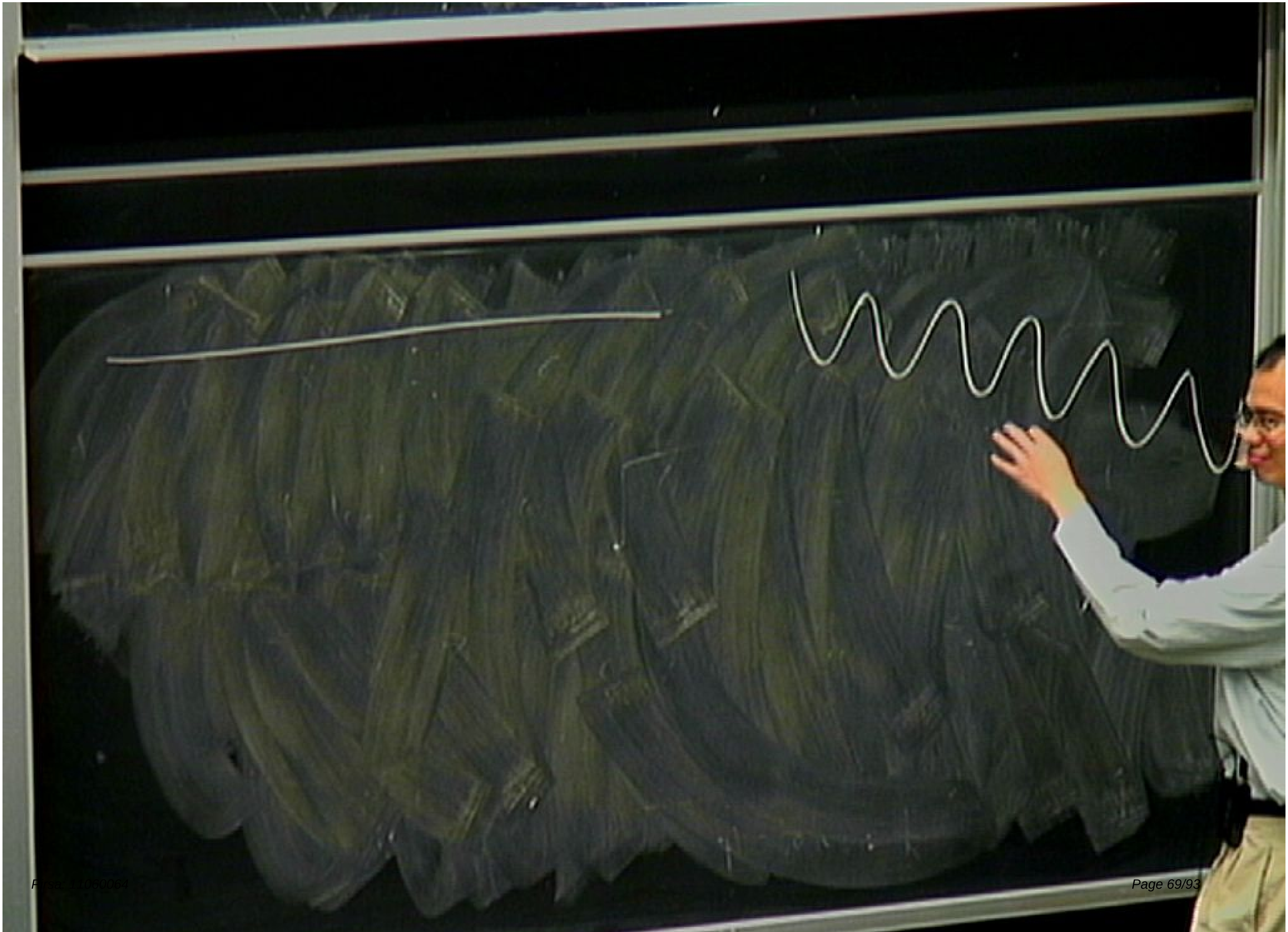

0907.3234, E, G, H, L
1005.3493 G H L Y
1005.3586 J, Y
Vc < VA
Vc > VB

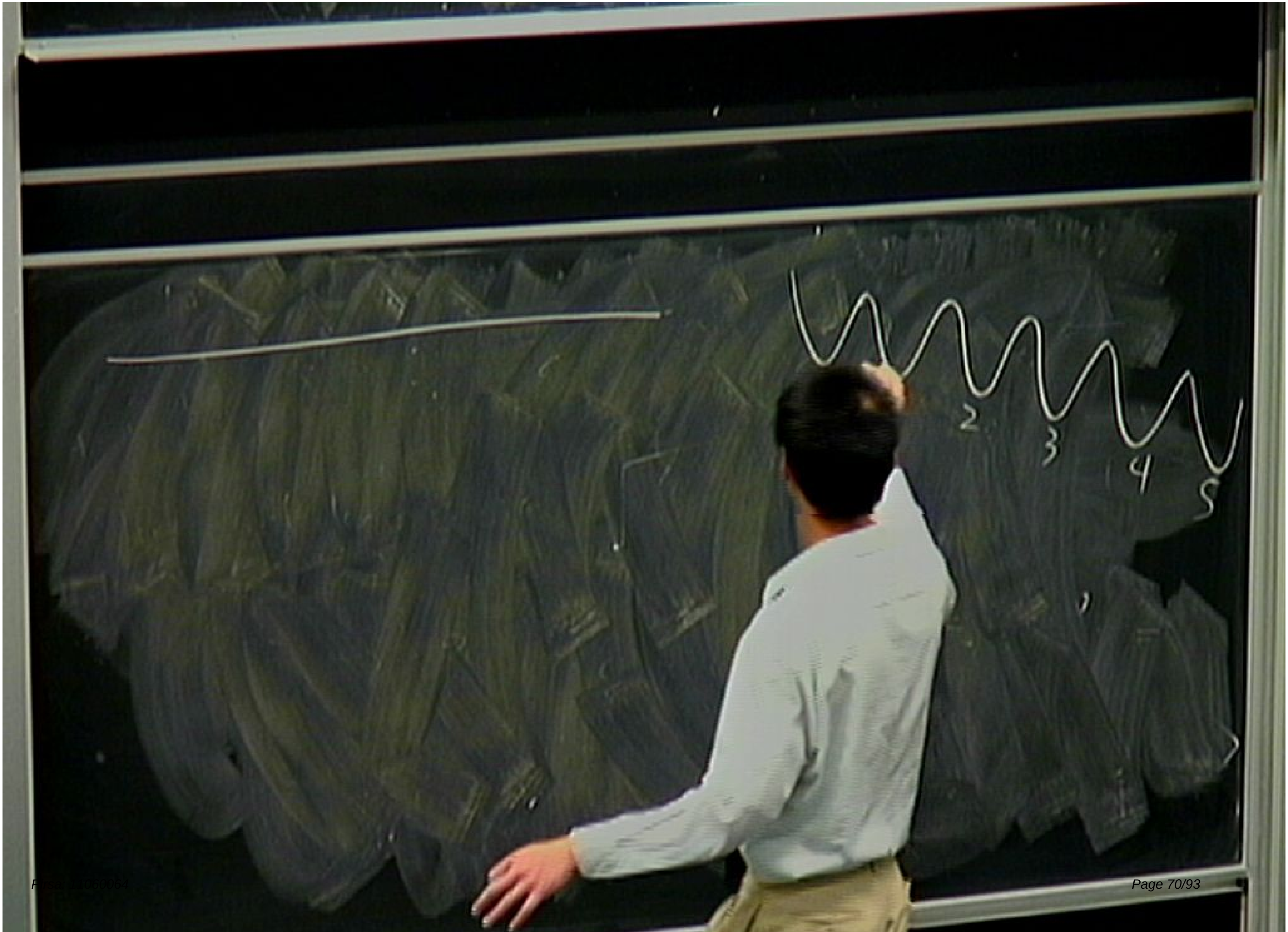


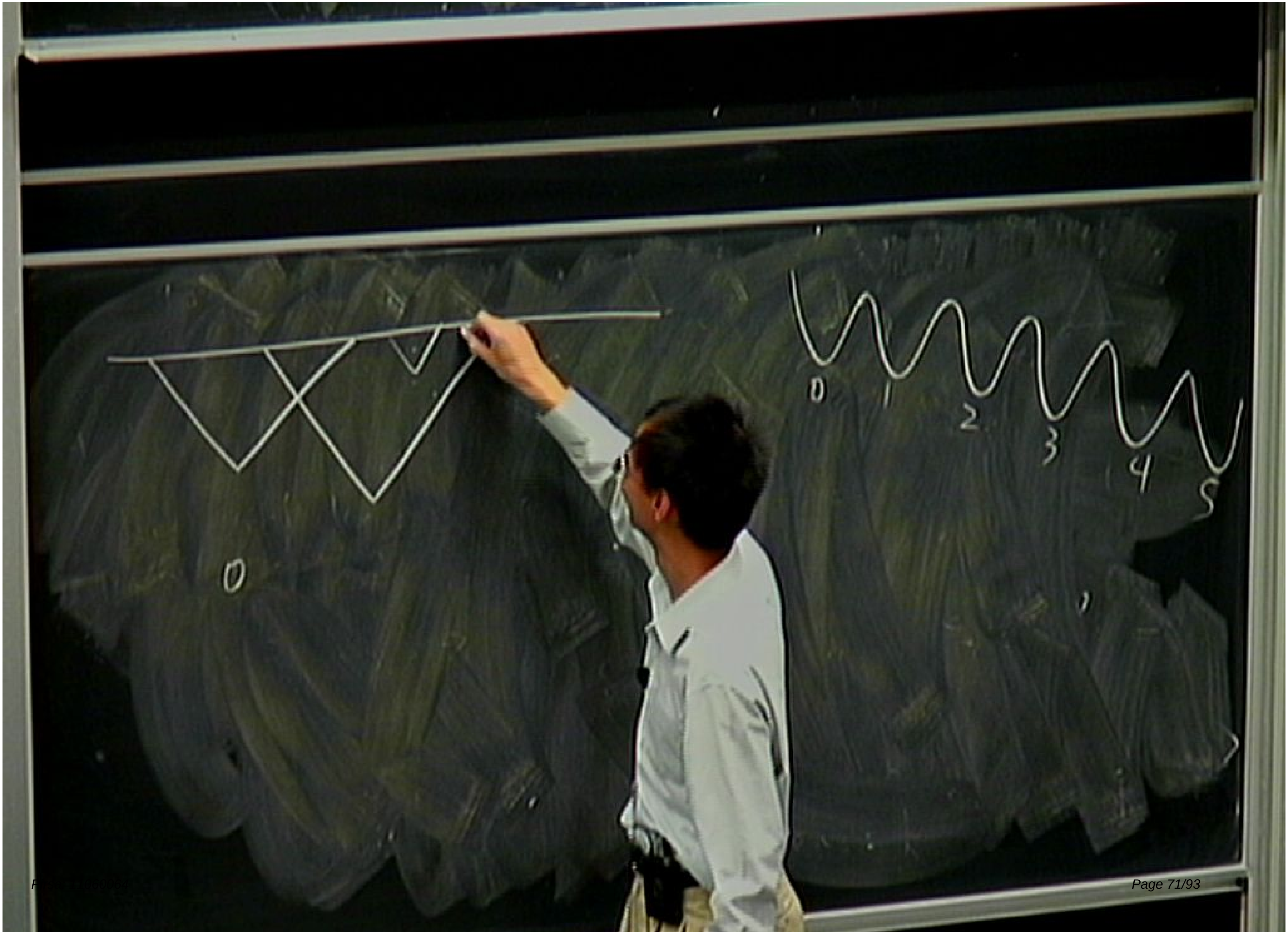
0907.3234, E. G, H, L
1005.3493 G H L Y
1005.3506 J. Y
$V_C < V_A$
$V_C > V_B$

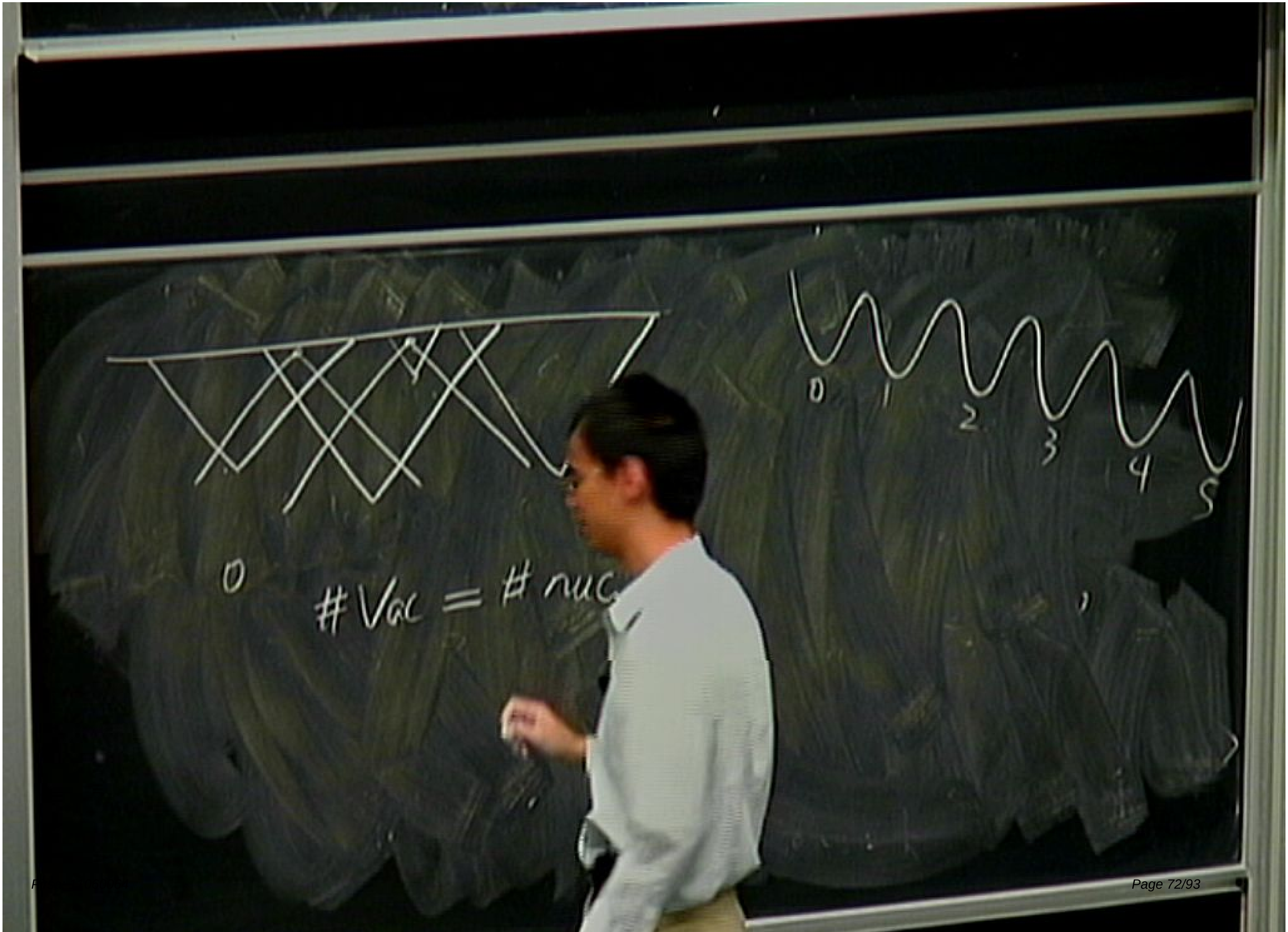

0907.3234, E. G, H. L
1005.3493 G H L Y
1005.3586 J. Y
Vc < VA
Vc > VB

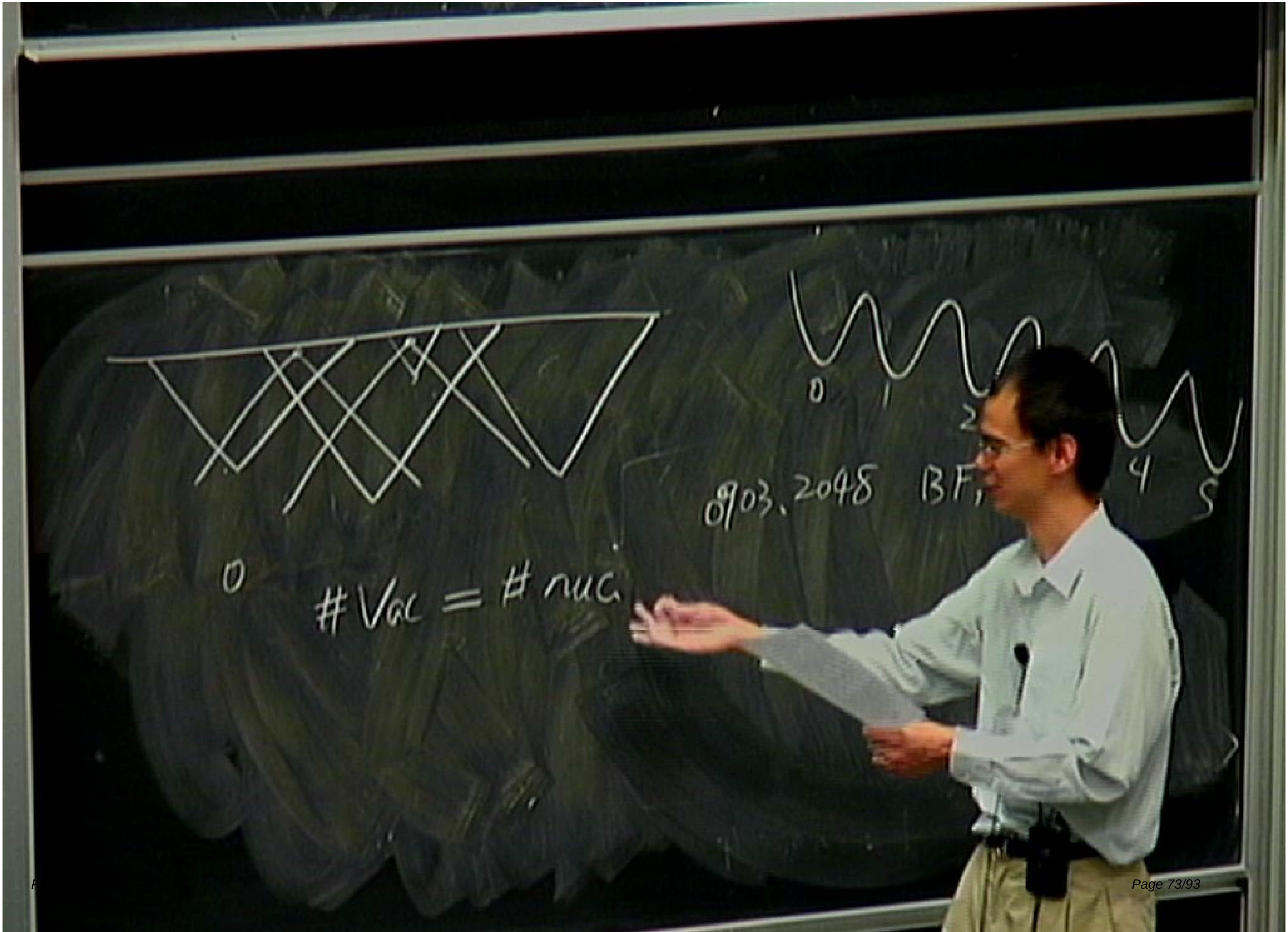


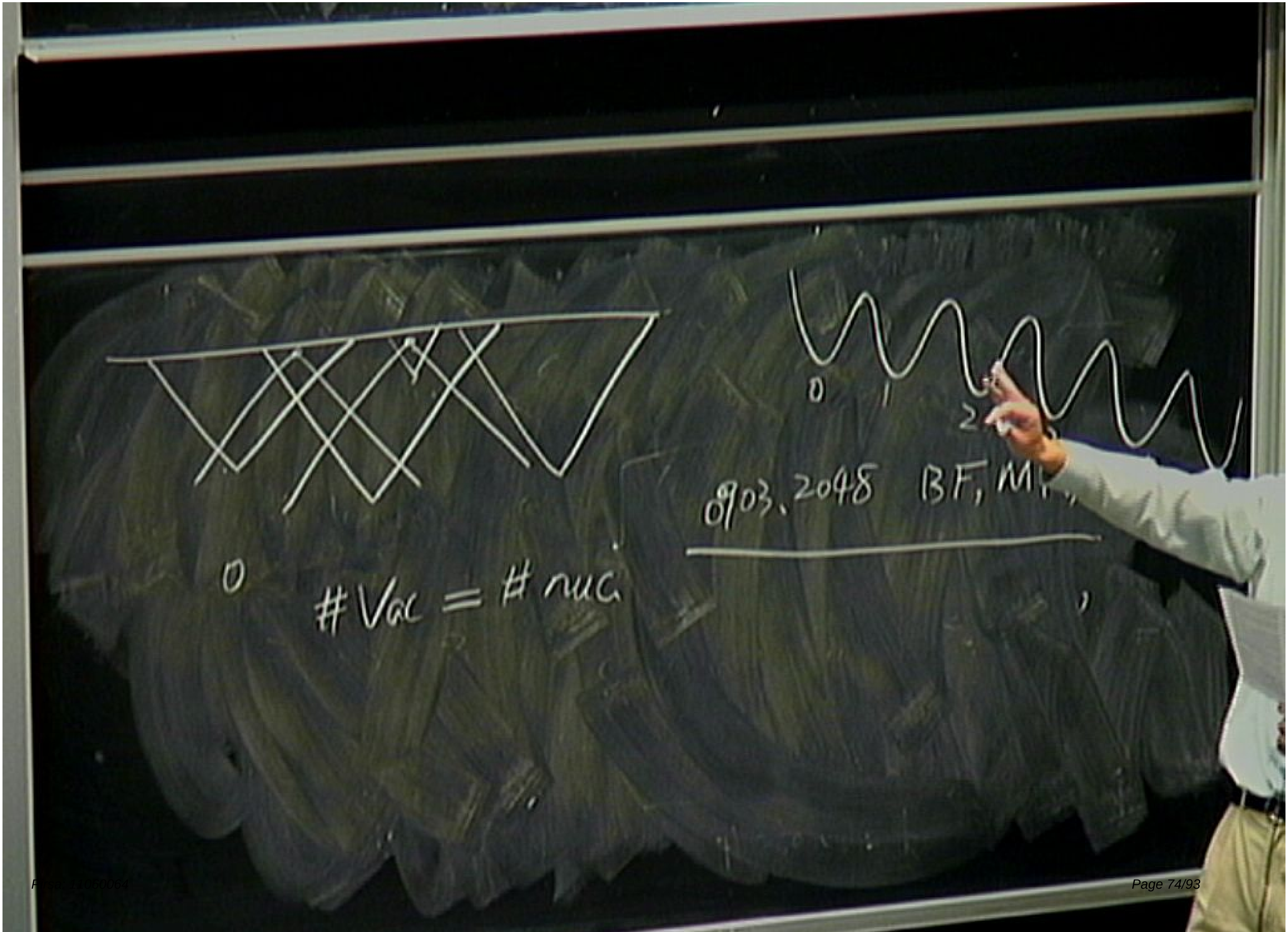


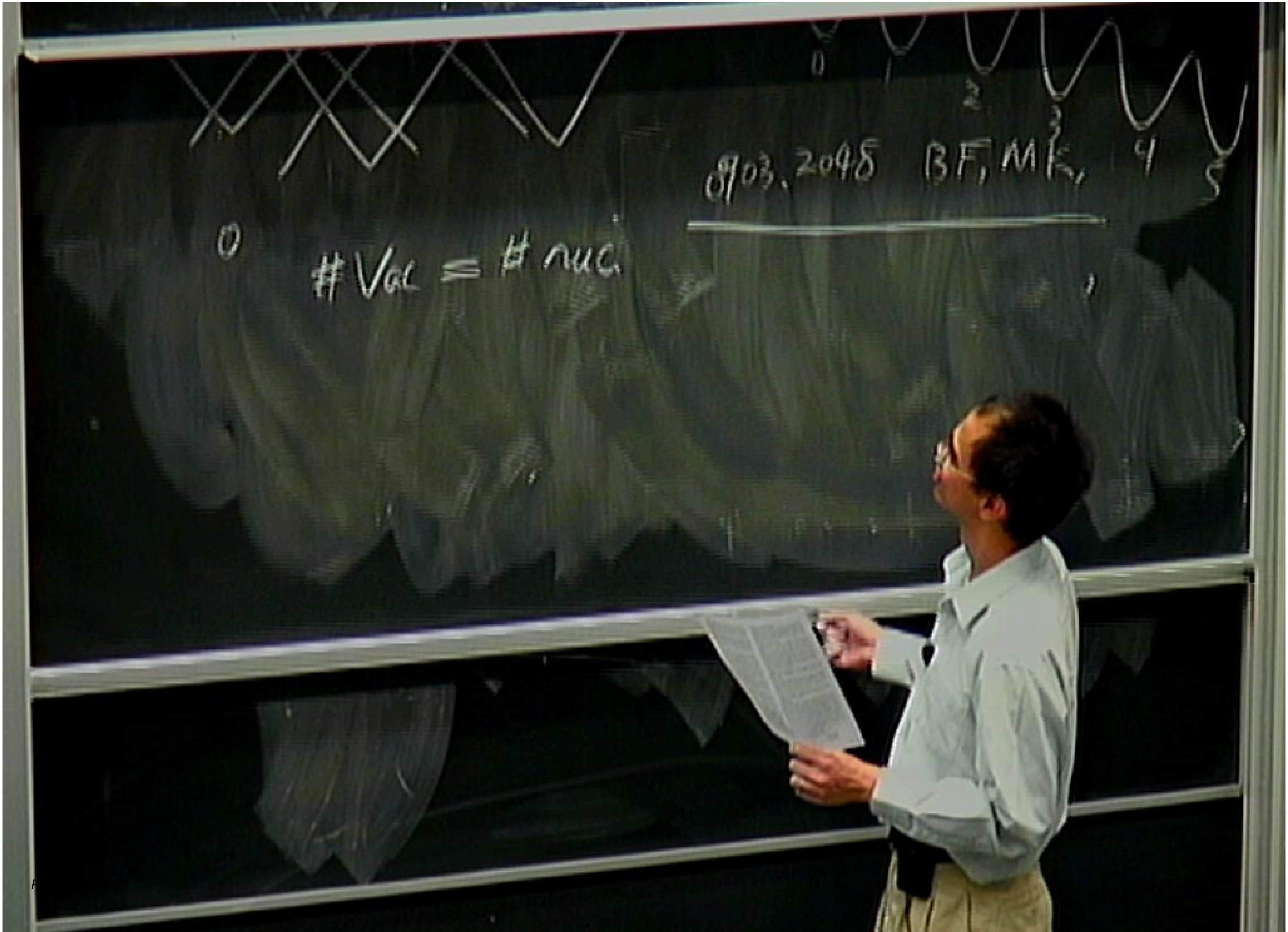

2
3
4
5

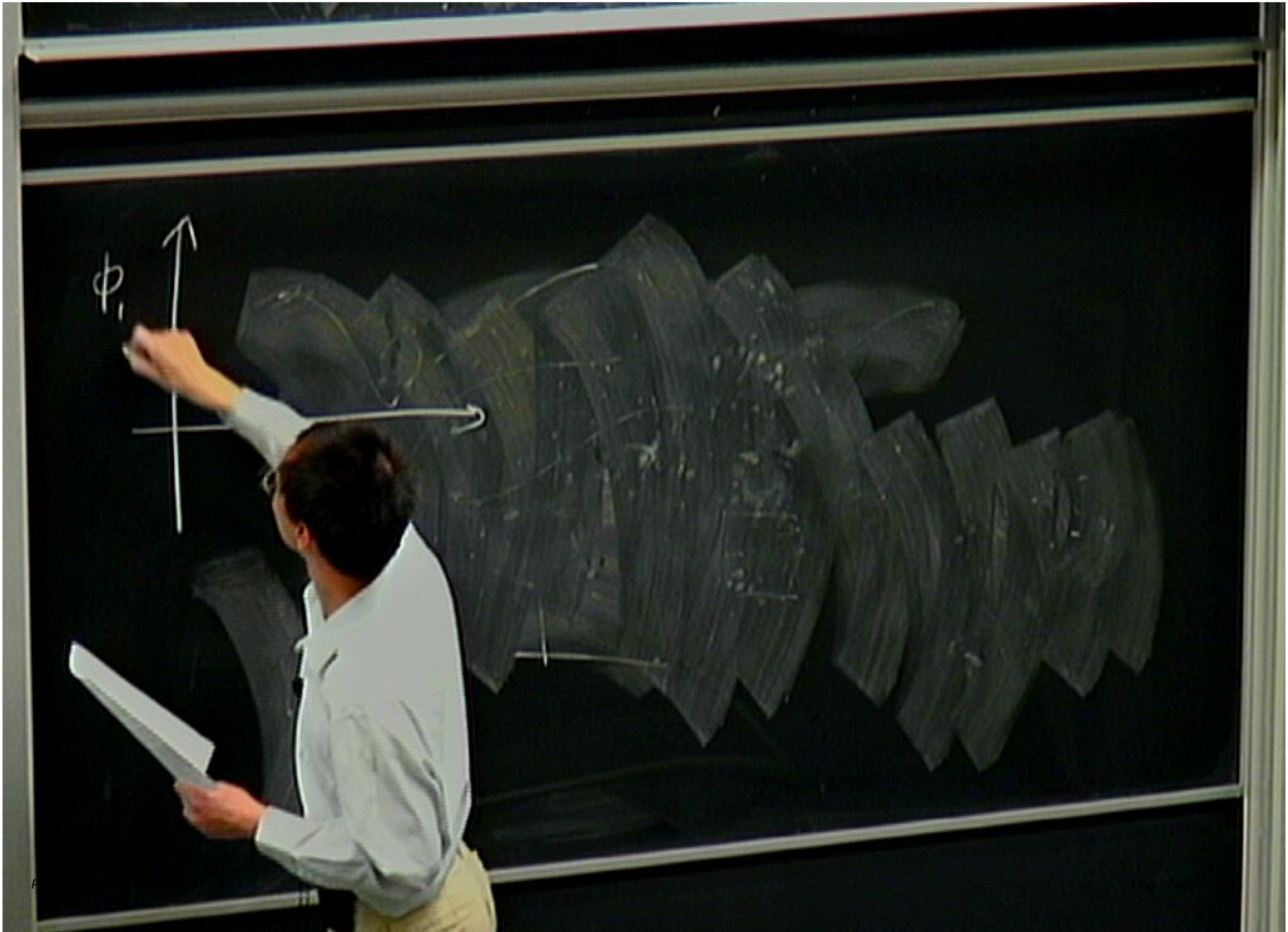

0
0 1 2 3 4 5

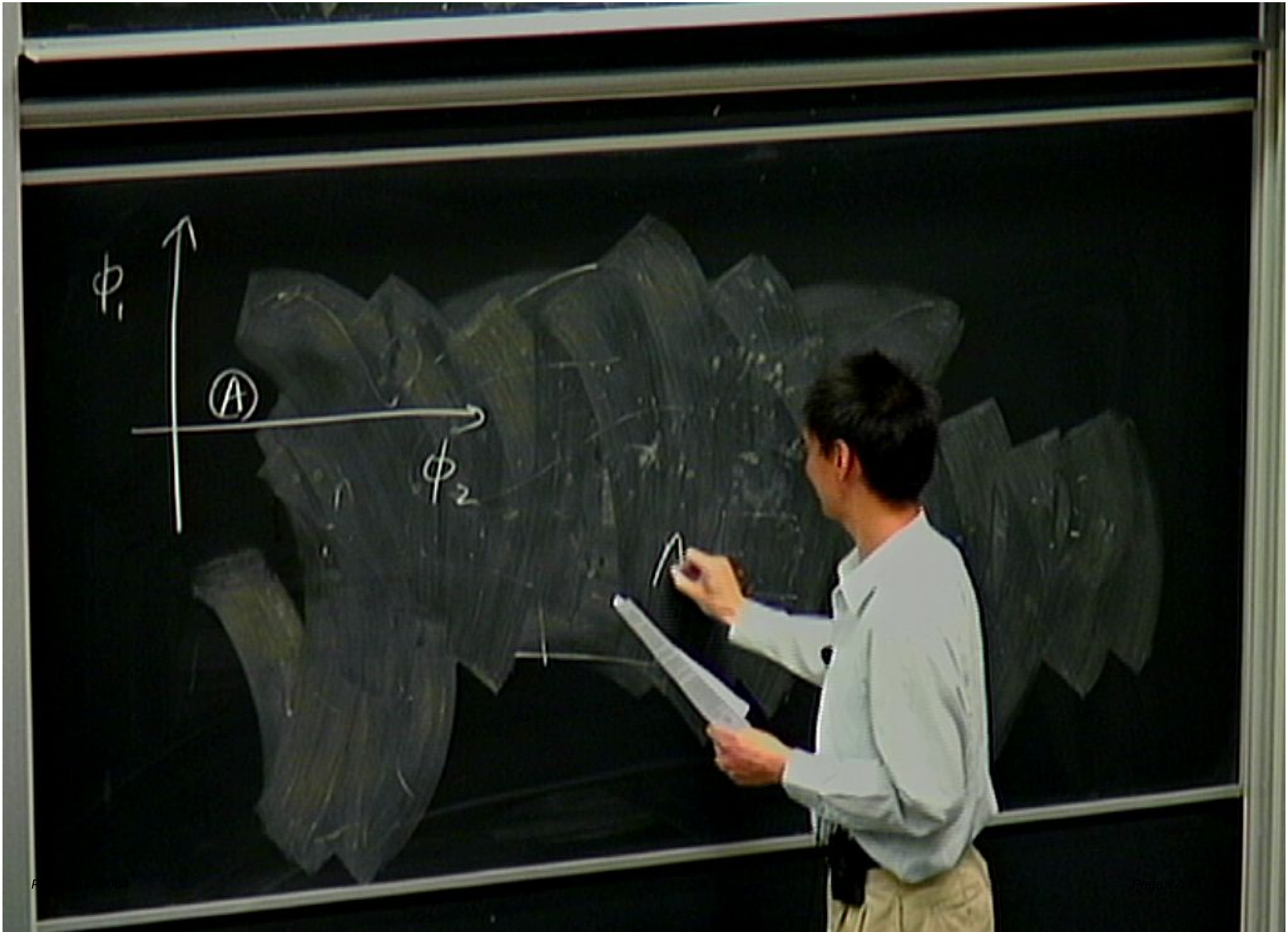

0 1 2 3 4 5
0
#Vac = # nuc

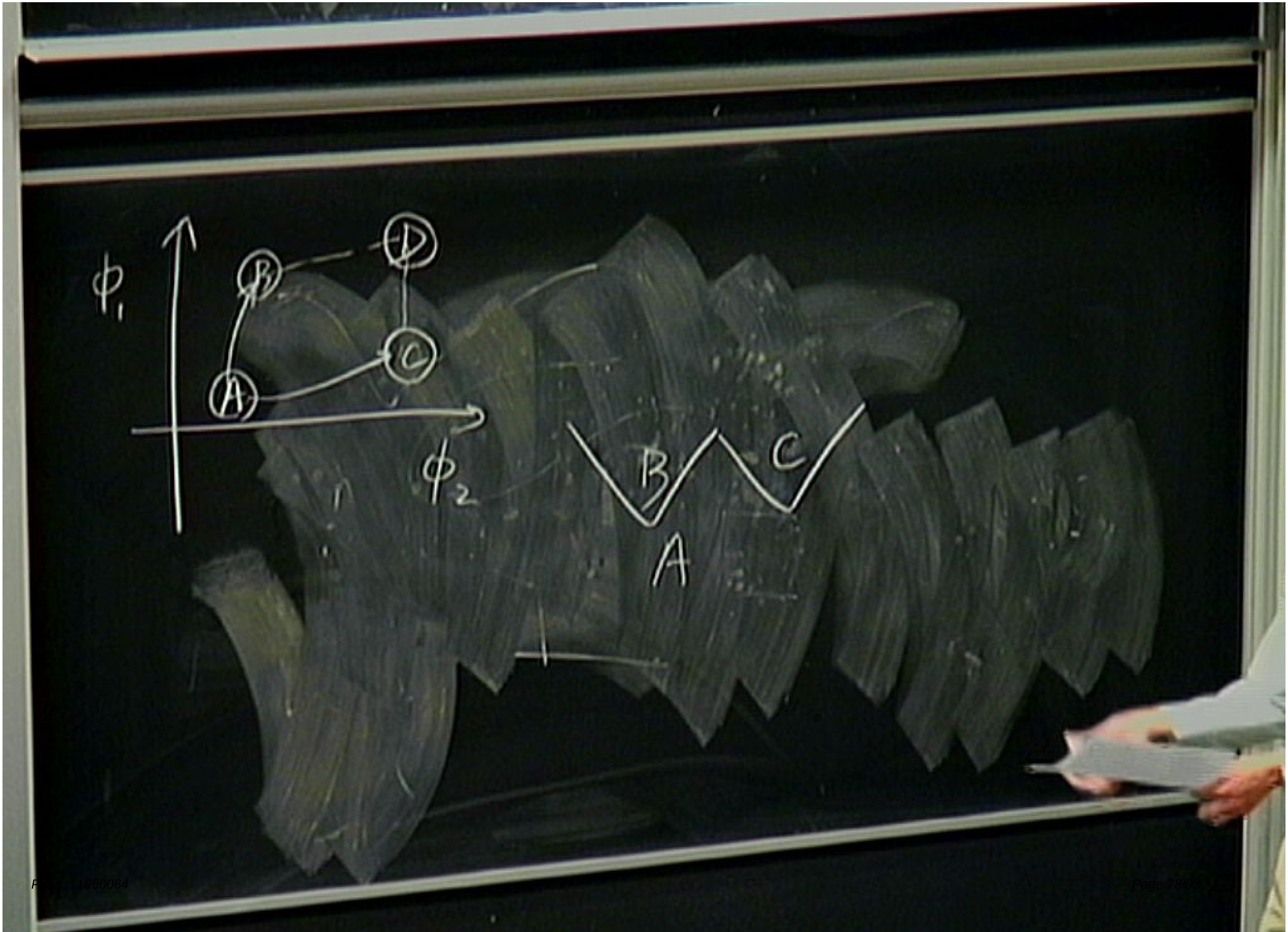

0
#Vac = # nuc
0903.2048 BF,
0 1 2 4 5

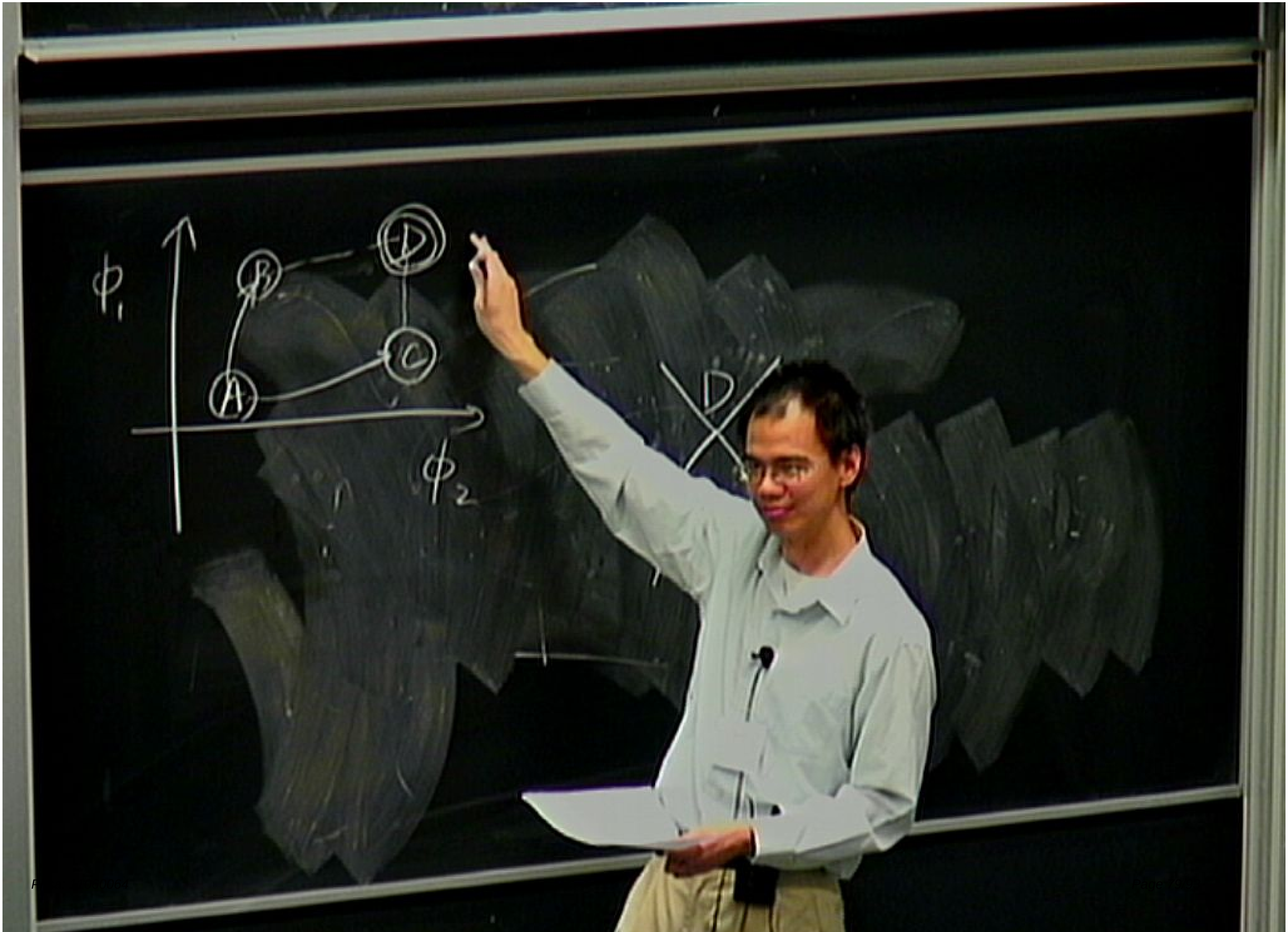

0903.2048 BF, M
0
#Vac = #nuc

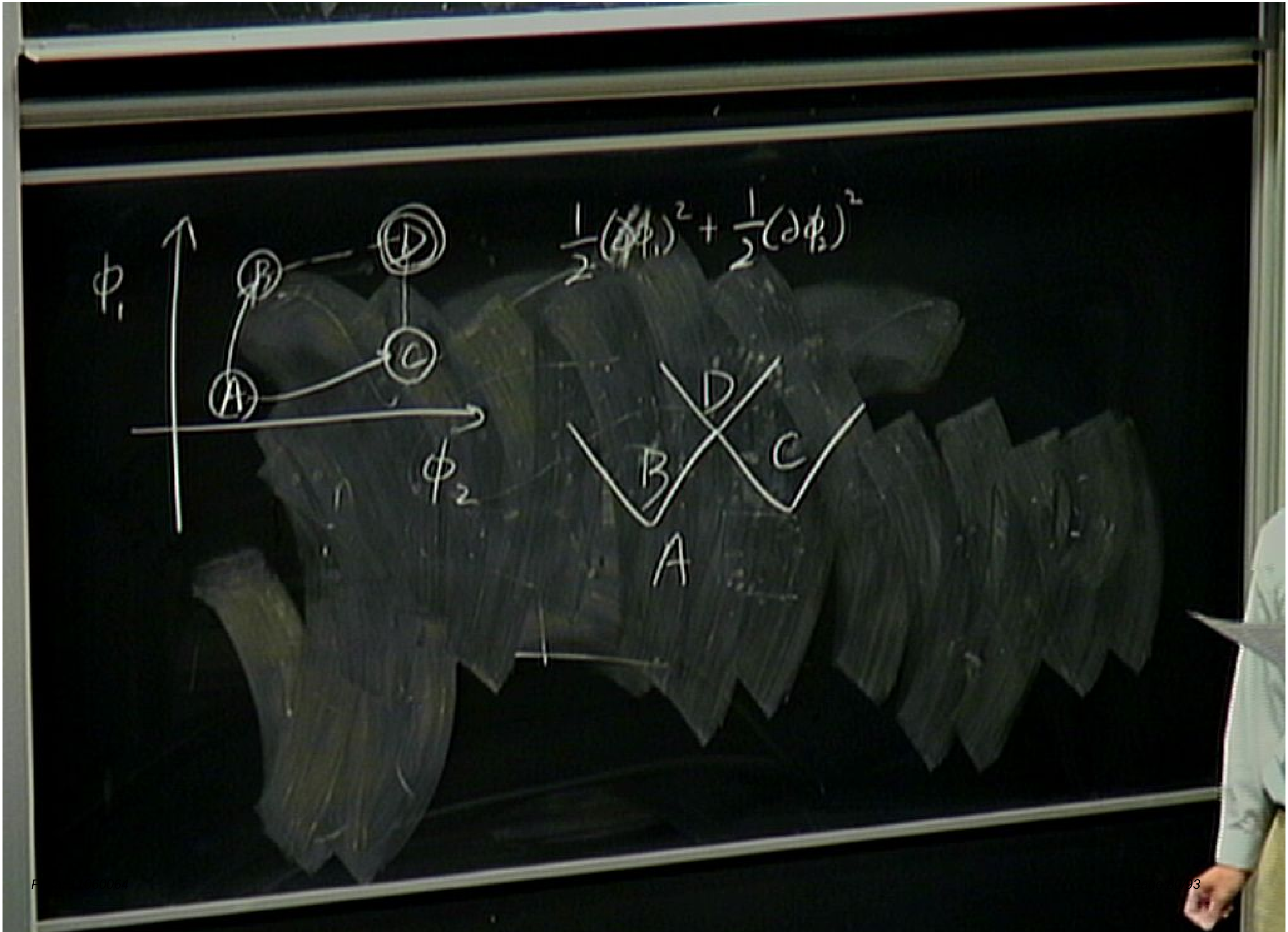

0903.2048 BF, MK,
#Vac = #nuc


φ1

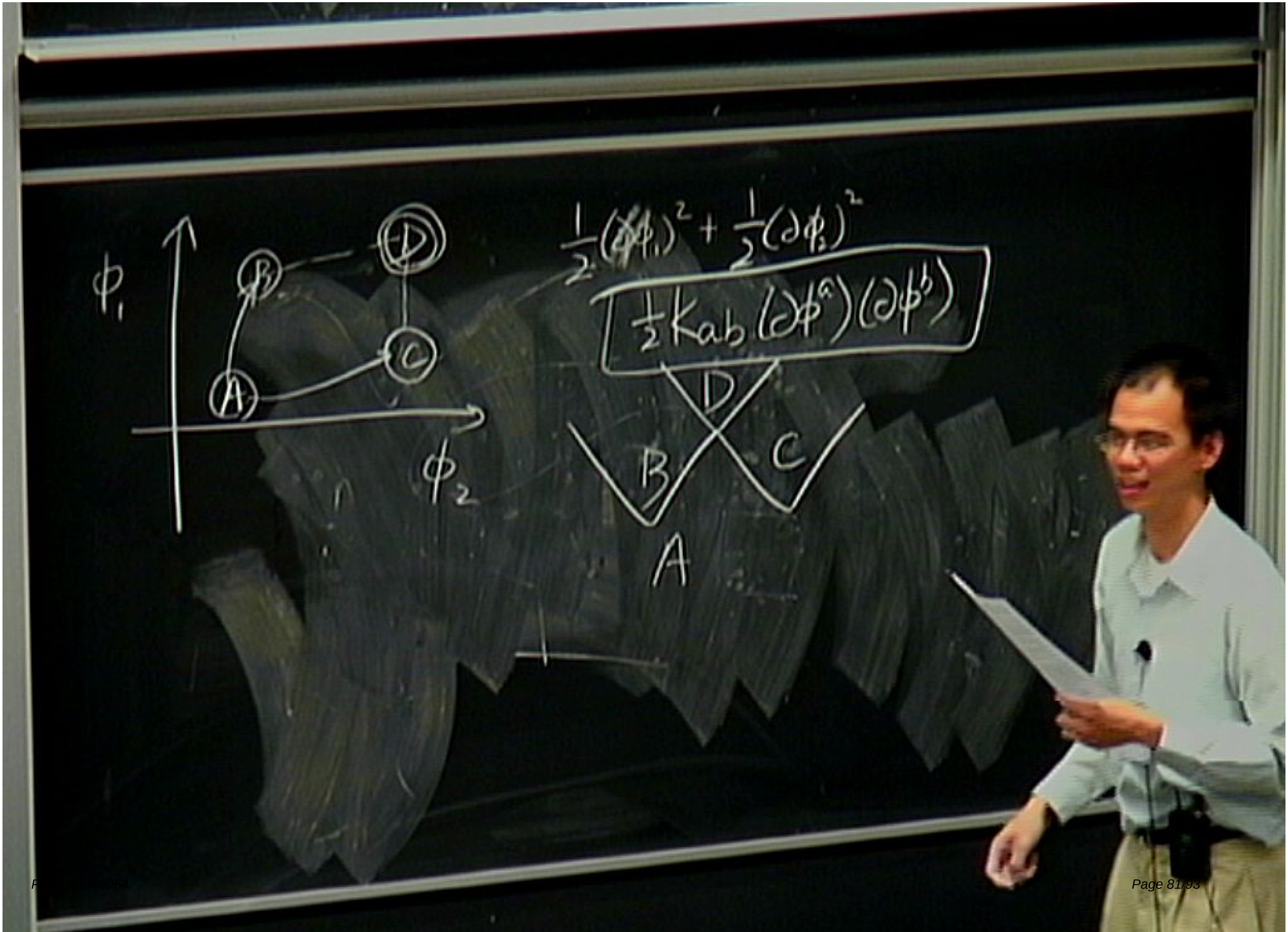

ϕ_1
A
ϕ_2

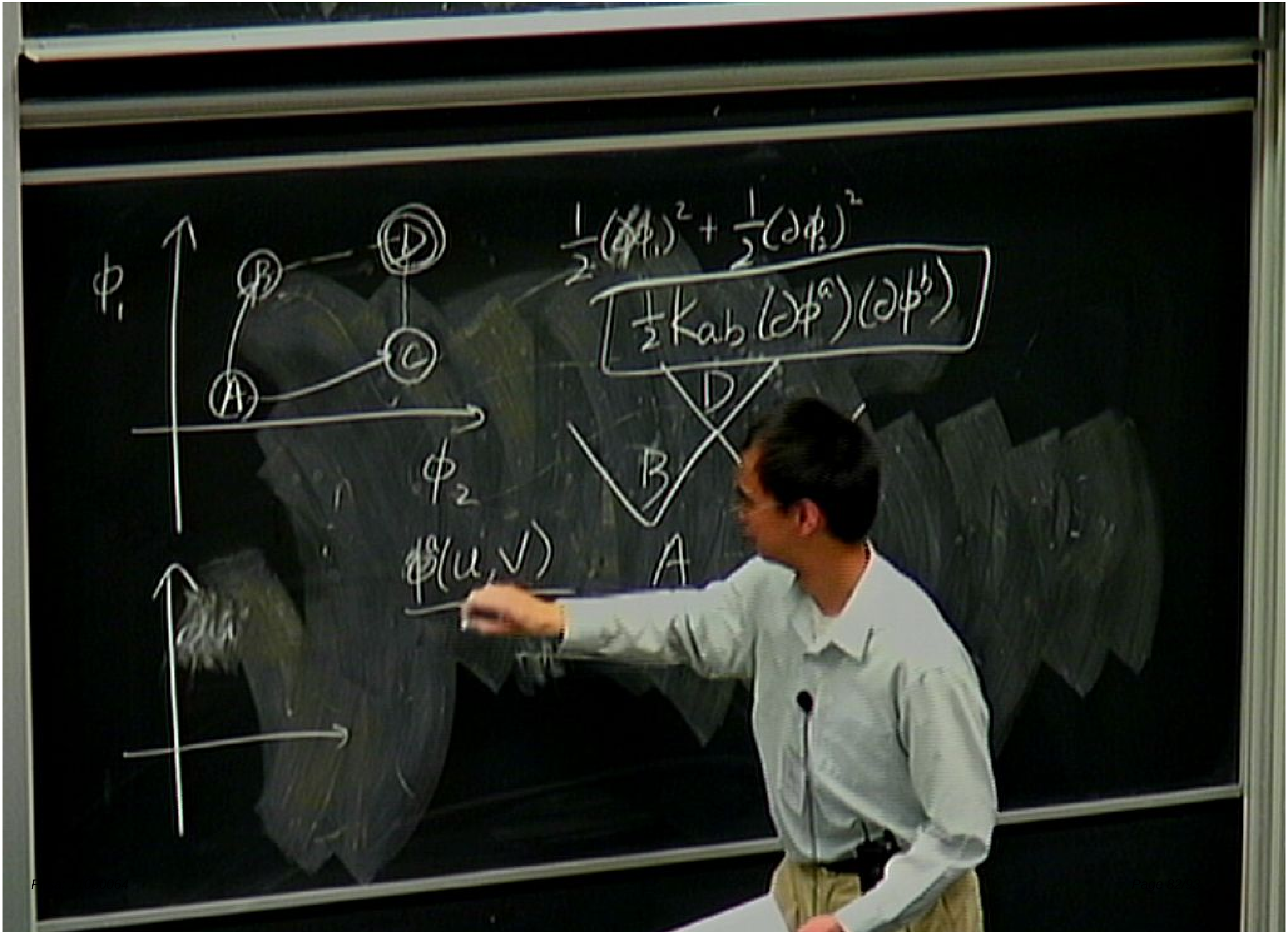

ϕ_1
ϕ_2
A
B
C
D
B
C
A


φ1
φ2
A
B
C
D

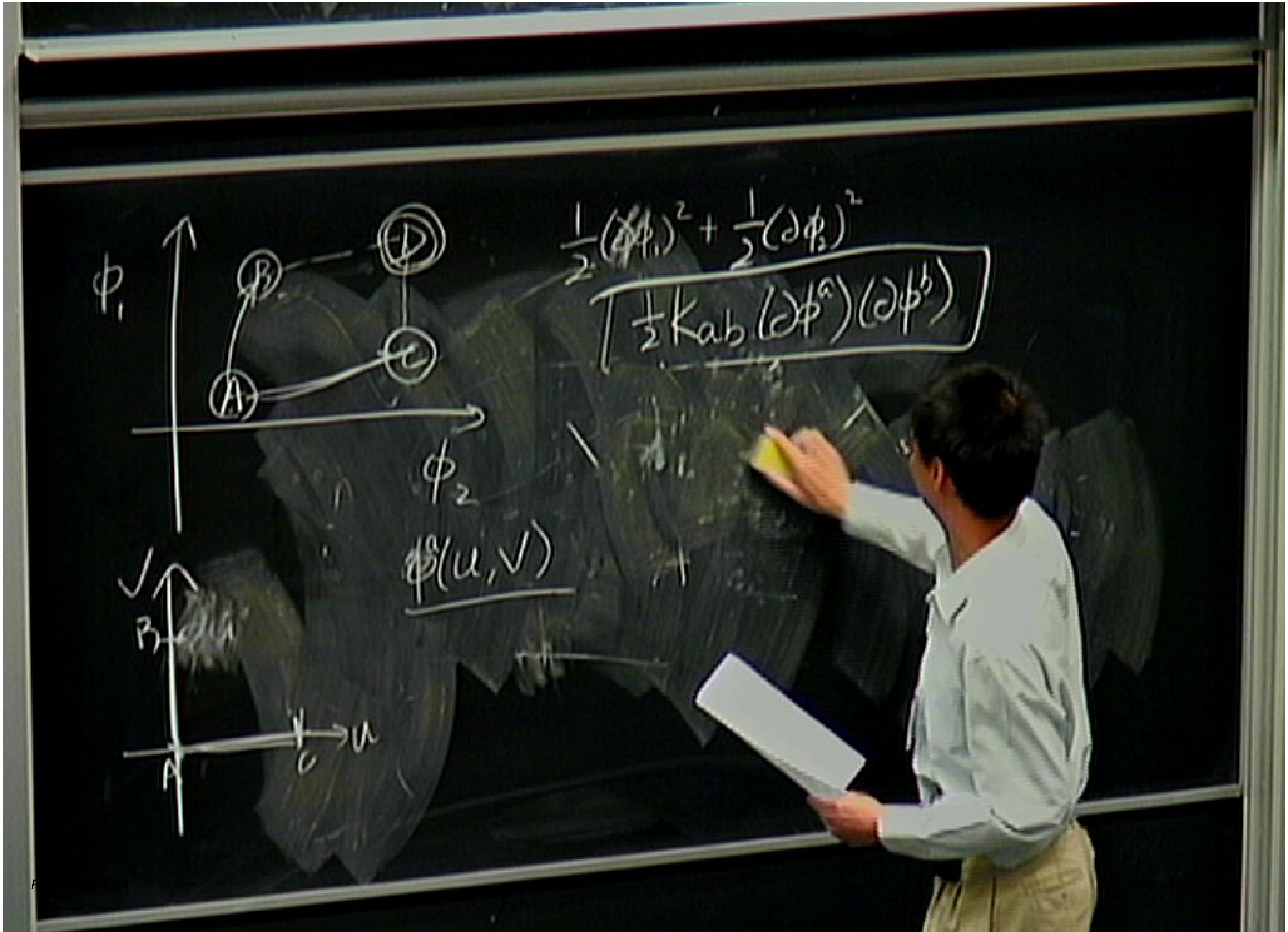


ϕ_1
ϕ_2
A
B
C
D
$\frac{1}{2}(\partial\phi_1)^2 + \frac{1}{2}(\partial\phi_2)^2$
D
B
C
A

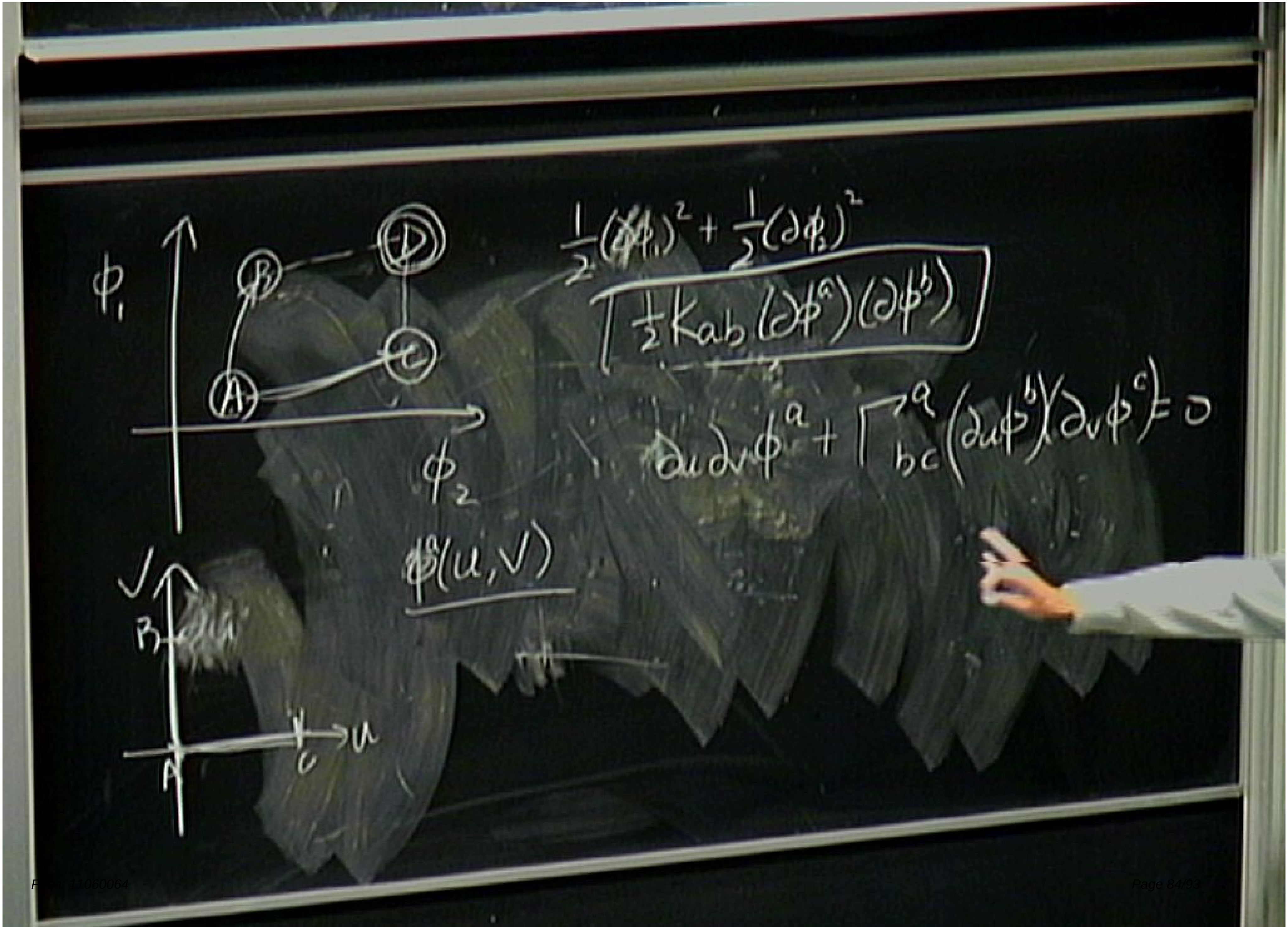

ϕ_1
ϕ_2
A
B
C
D
$\frac{1}{2}(\partial\phi_1)^2 + \frac{1}{2}(\partial\phi_2)^2$
$\frac{1}{2} K_{ab} (\partial\phi^a)(\partial\phi^b)$
D
B
C
A

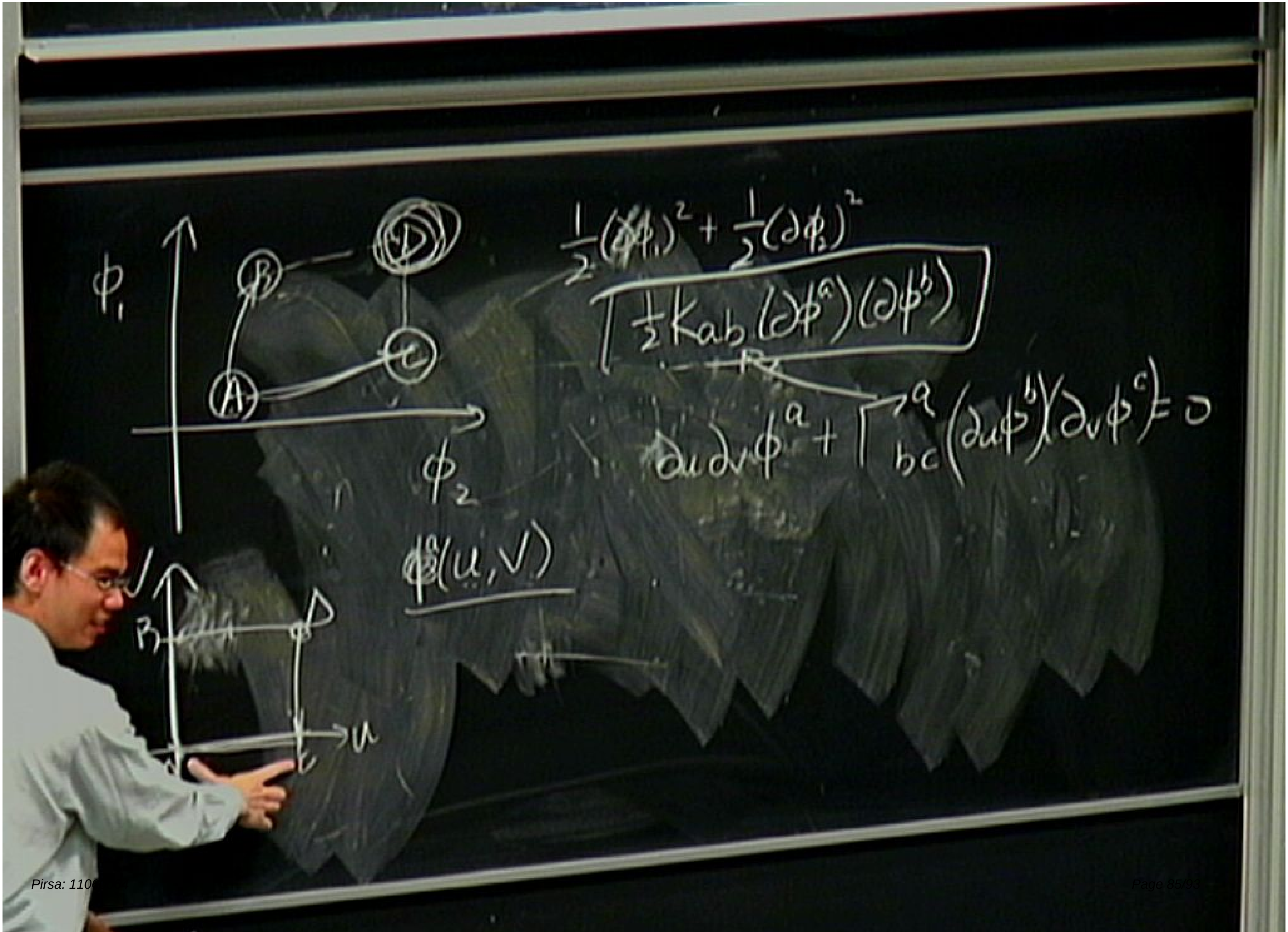


φ1
A
B
C
D
φ2
1/2(∂φ1)^2 + 1/2(∂φ2)^2
1/2 Kab (∂φ^a)(∂φ^b)
D
B
A
φ(u,v)

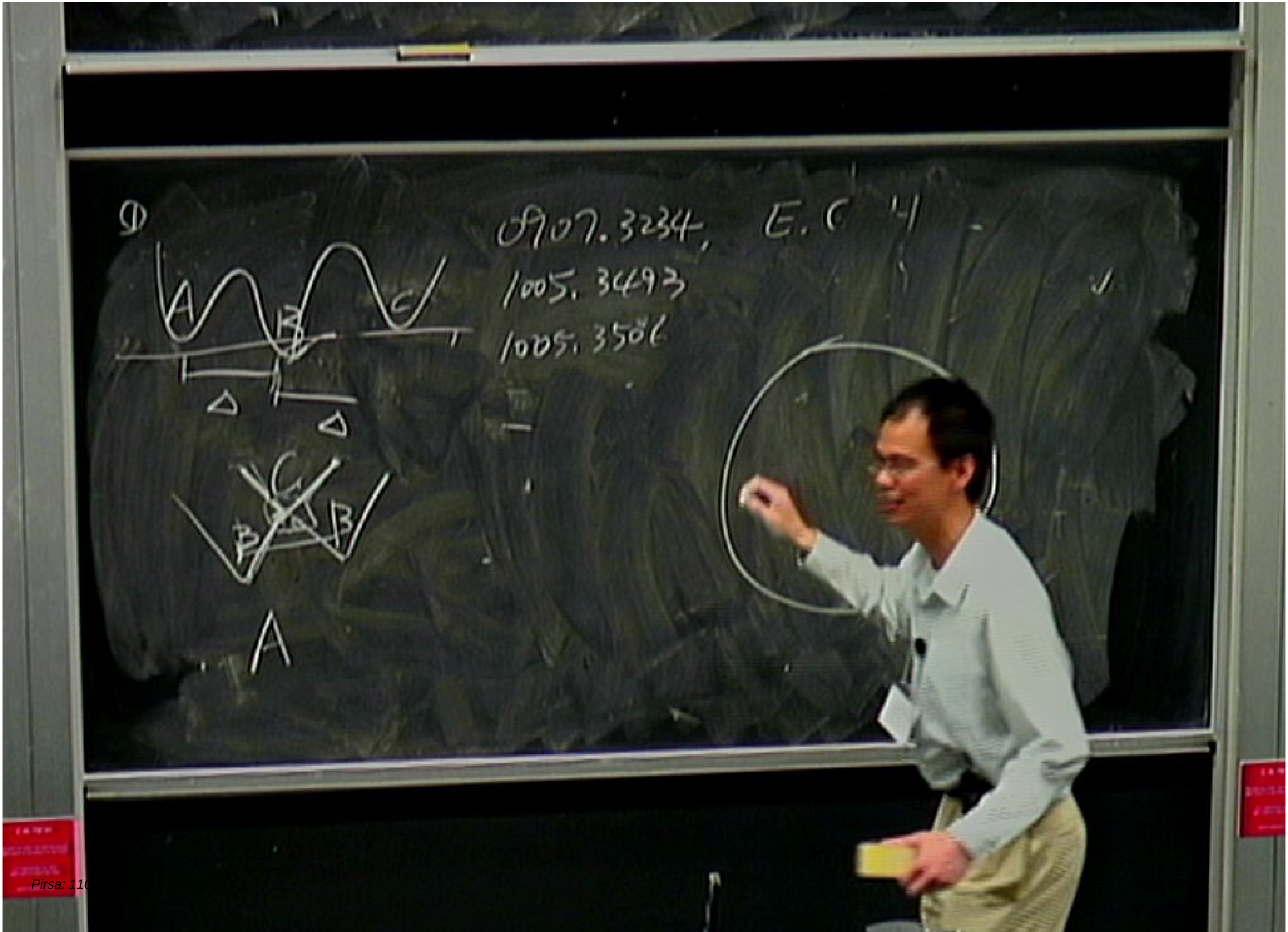


ϕ_1
ϕ_2
$\frac{1}{2}(\partial\phi_1)^2 + \frac{1}{2}(\partial\phi_2)^2$
$\frac{1}{2}K_{ab}(\partial\phi^a)(\partial\phi^b)$
$\phi(u,v)$

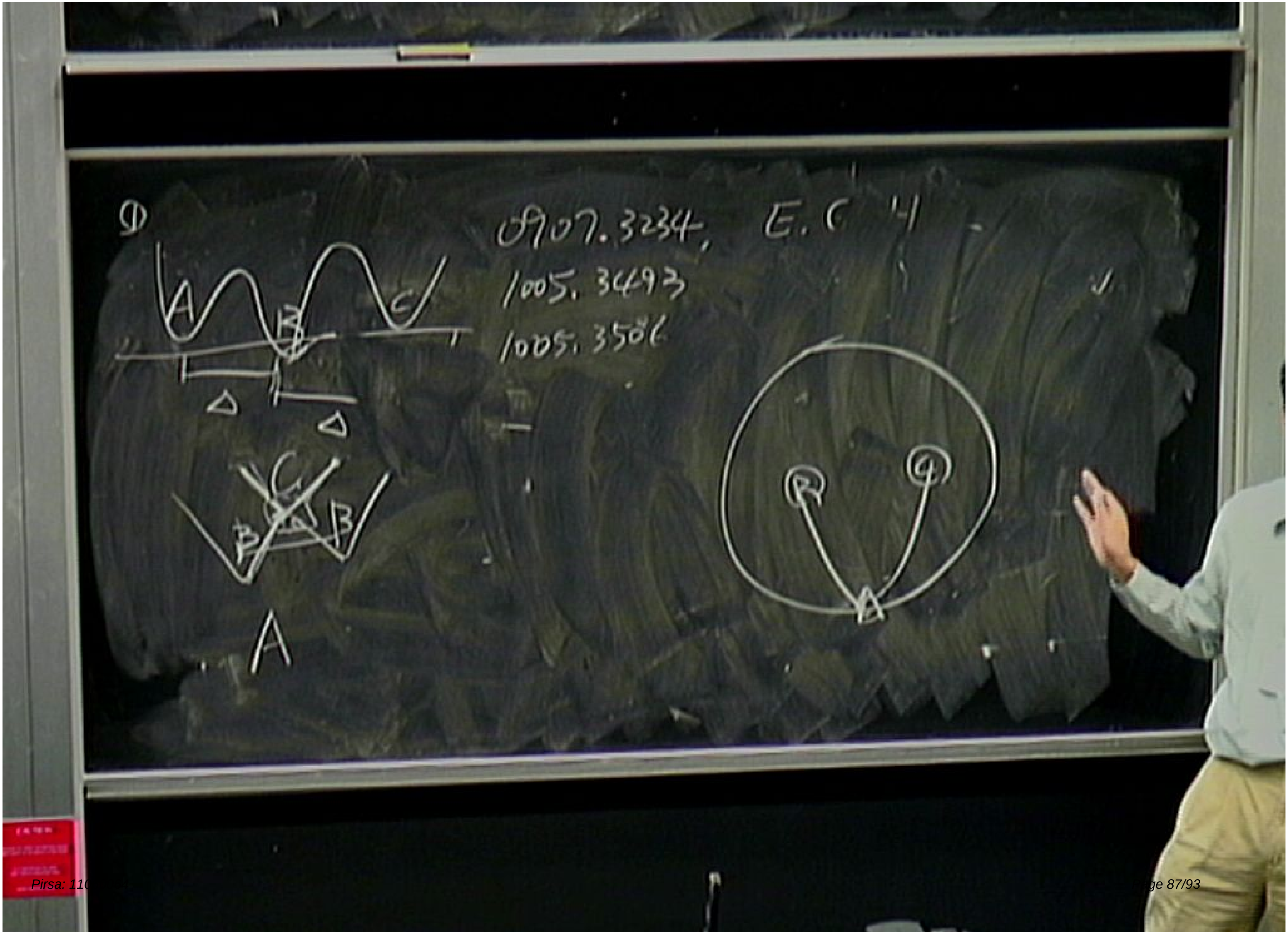

$\frac{1}{2}(\partial\phi_1)^2 + \frac{1}{2}(\partial\phi_2)^2$
$\frac{1}{2}K_{ab}(\partial\phi^a)(\partial\phi^b)$
$\partial_u\partial_v\phi^a + \Gamma^a_{bc}(\partial_u\phi^b)(\partial_v\phi^c) = 0$
ϕ_1
ϕ_2
$\phi^a(u,v)$
A
B
C
D
v
u

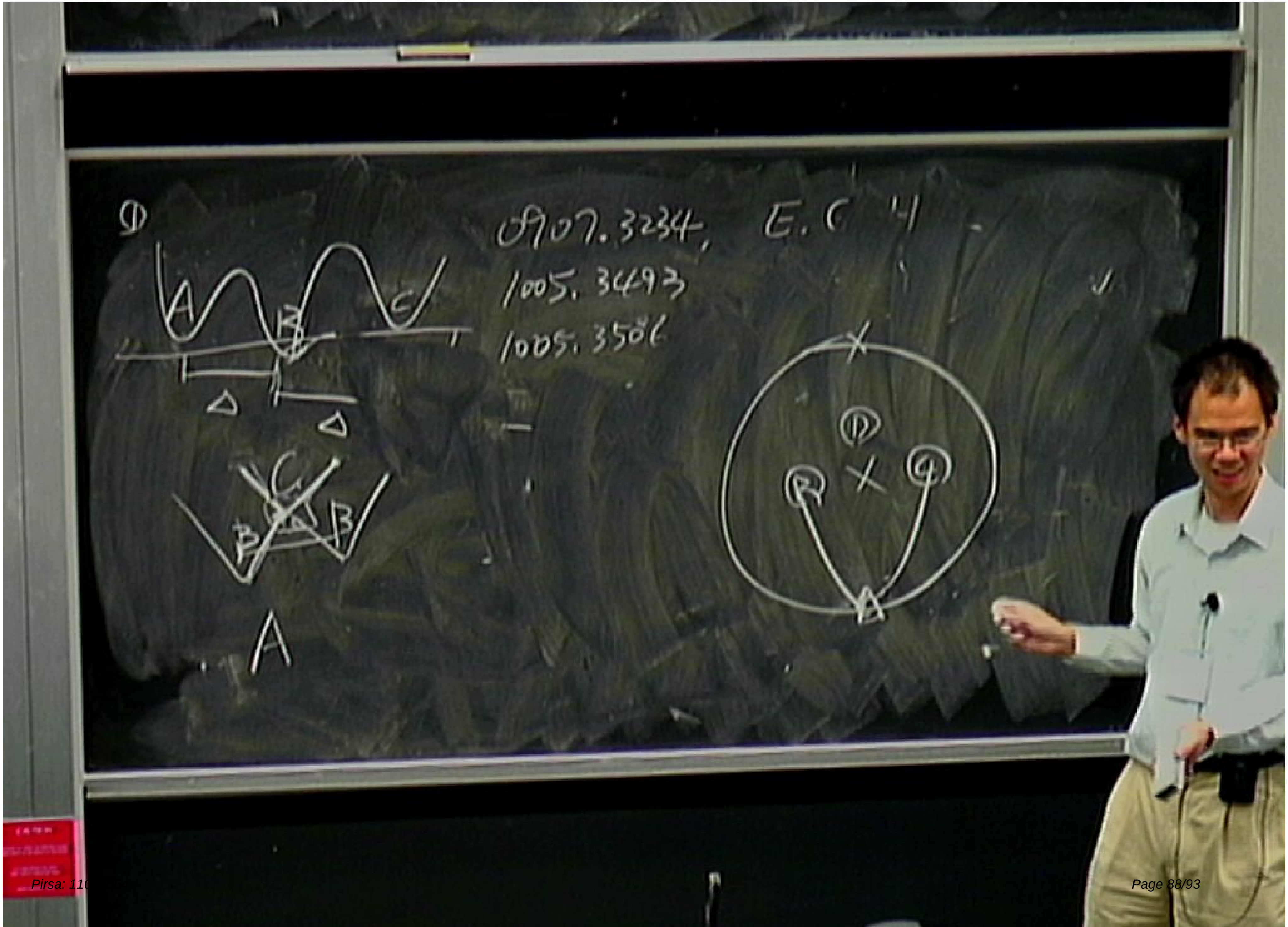


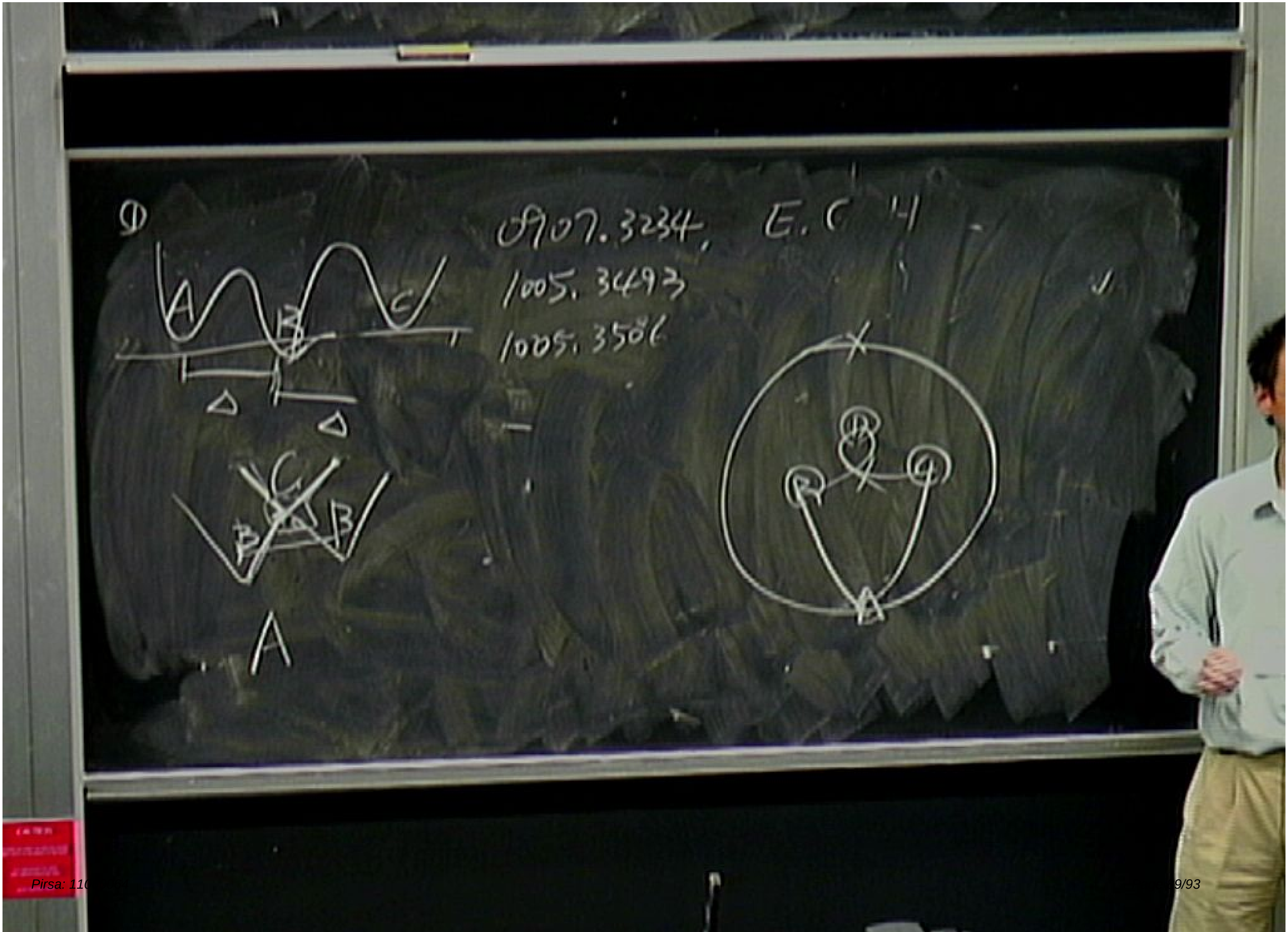
φ1
φ2
A
B
C
D
1/2 (∂φ1)^2 + 1/2 (∂φ2)^2
1/2 Kab (∂φ^a)(∂φ^b)
∂u∂v φ^a + Γ^a bc (∂u φ^b)(∂v φ^c) = 0
φ(u,v)
u
v

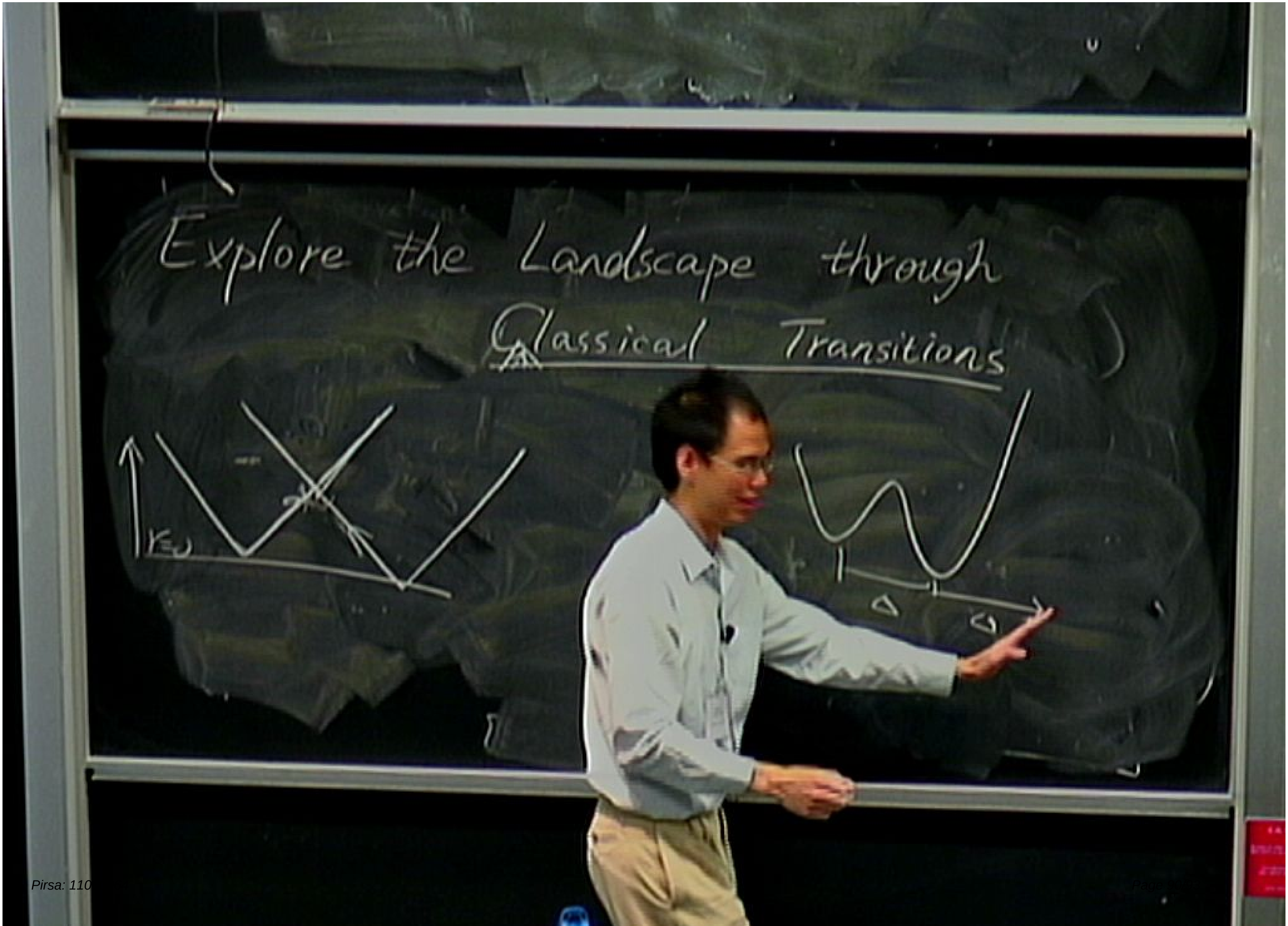


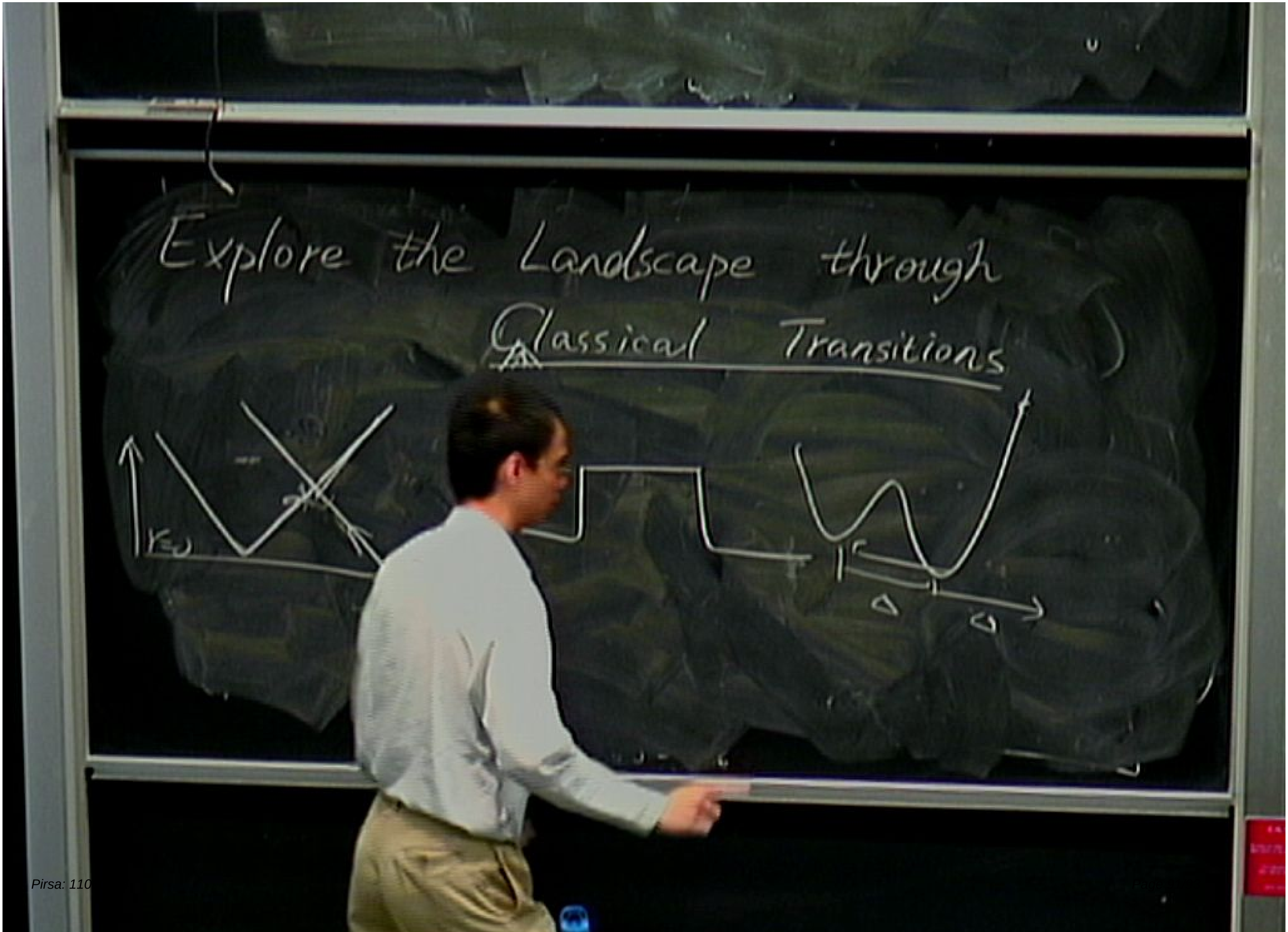
0907.3234, E. C. H.
1005.3493
1005.3506
A
B
C
Δ
A

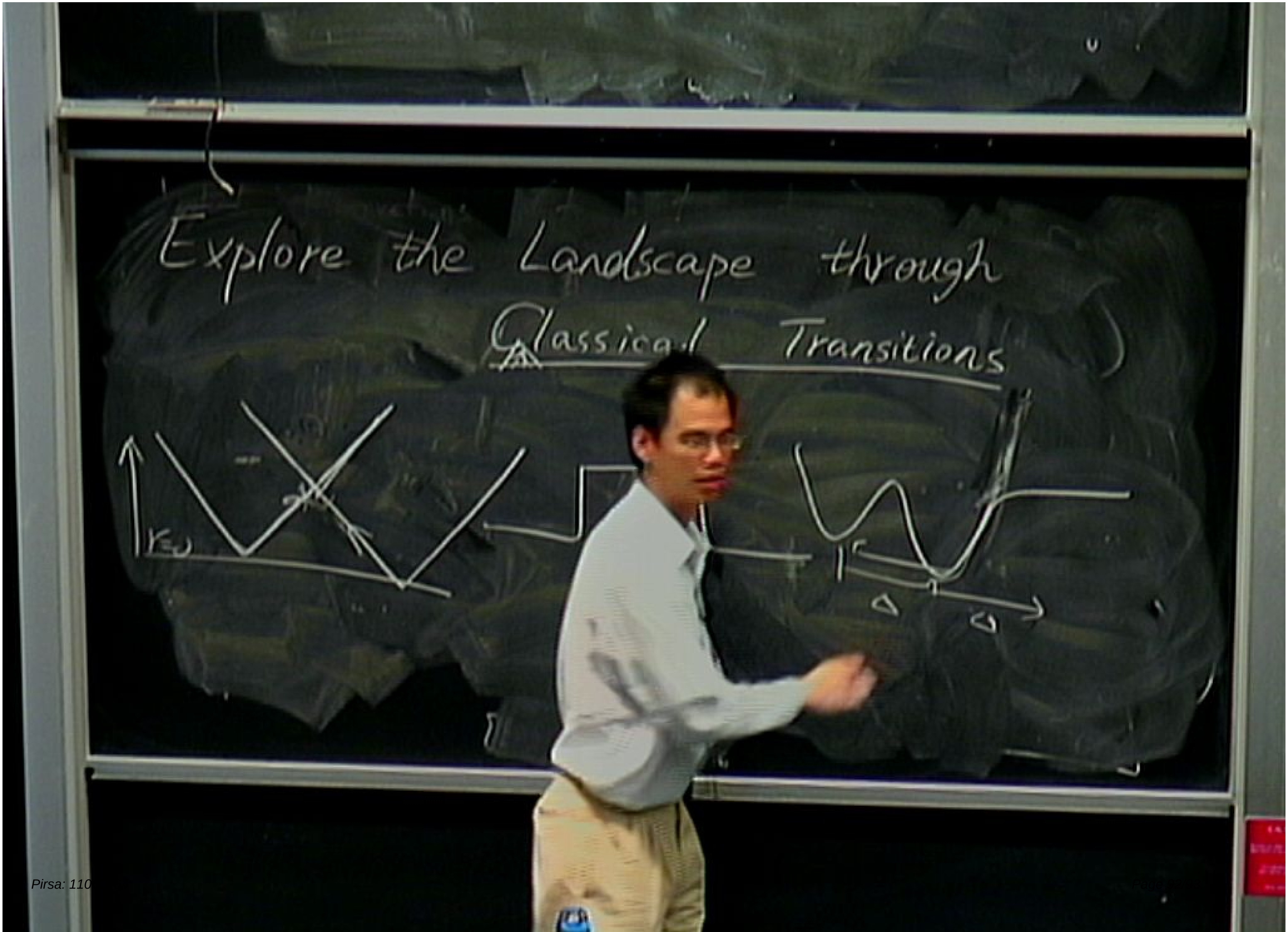

0907.3234,
1005.3493
1005.3506


0907.3234, E. C 4
1005.3493
1005.3506

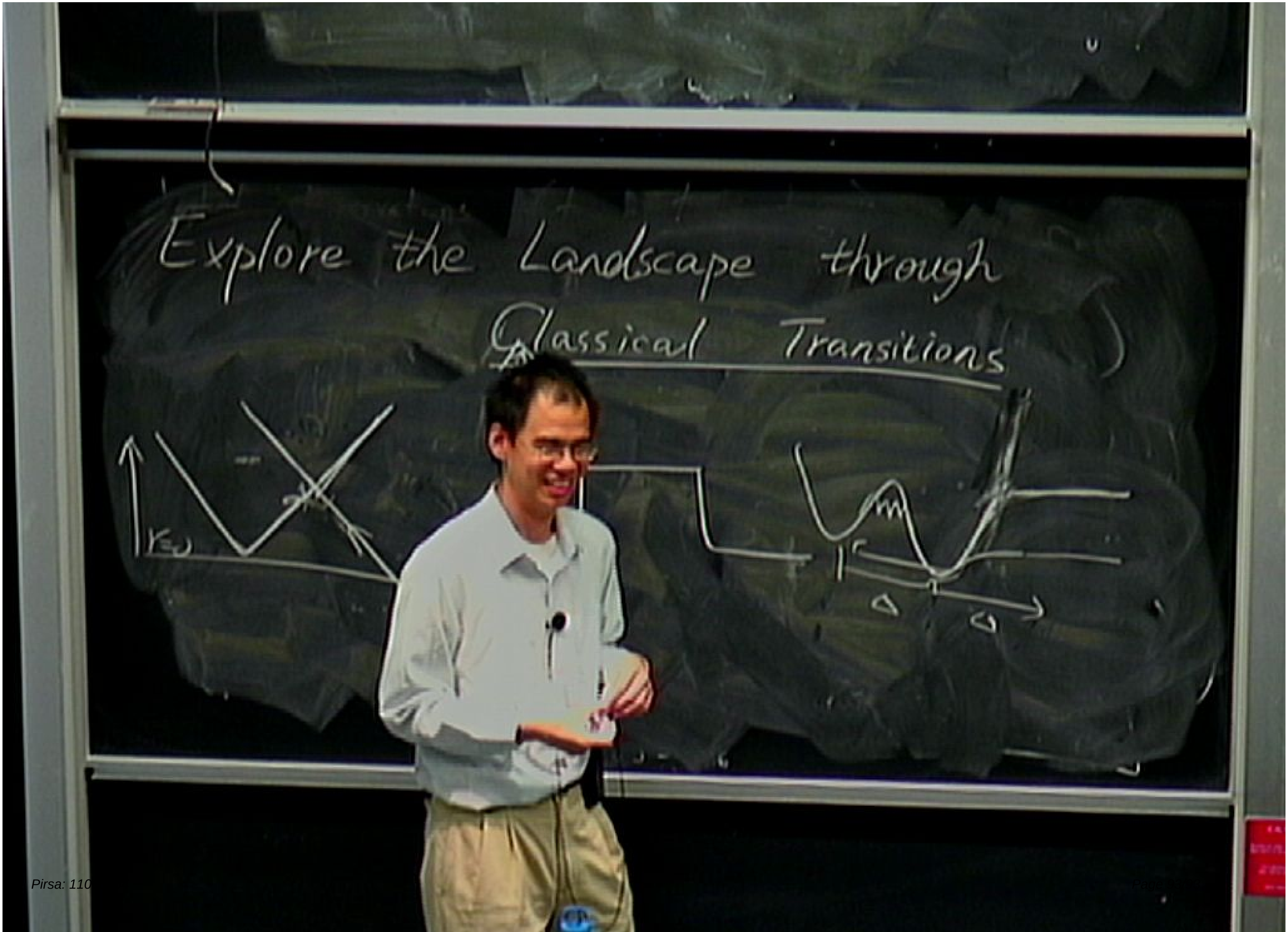

0907.3234,
1005.3493
1005.3586
A
B
C
Δ


Explore the Landscape through
Classical Transitions


Explore the Landscape through
Classical Transitions



Explore the Landscape through
Classical Transitions



Explore the Landscape through
Classical Transitions