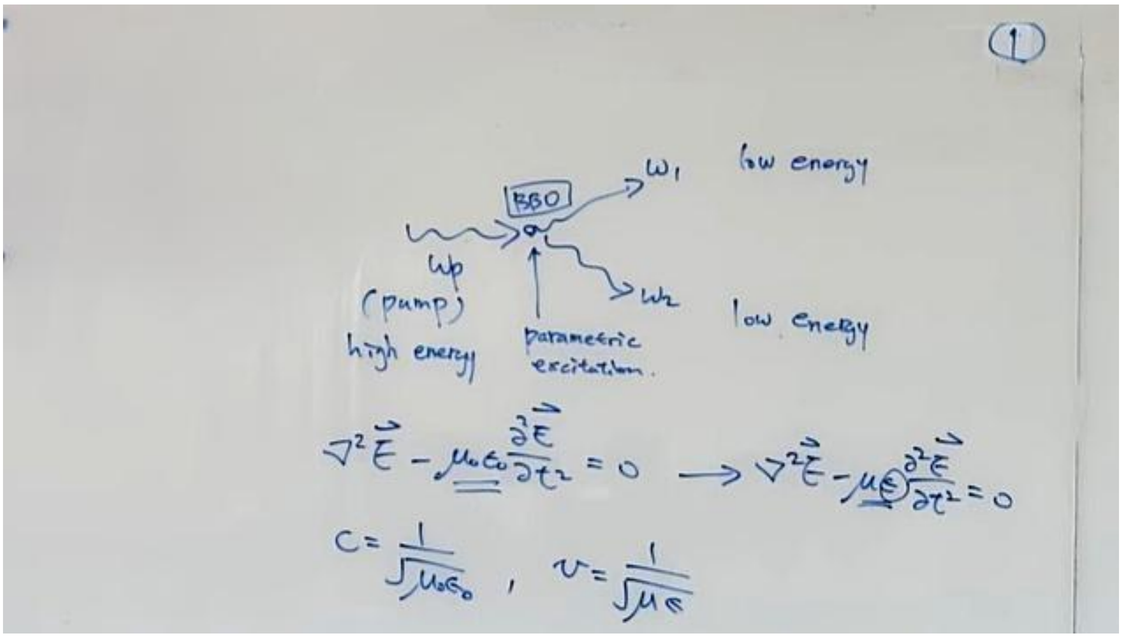
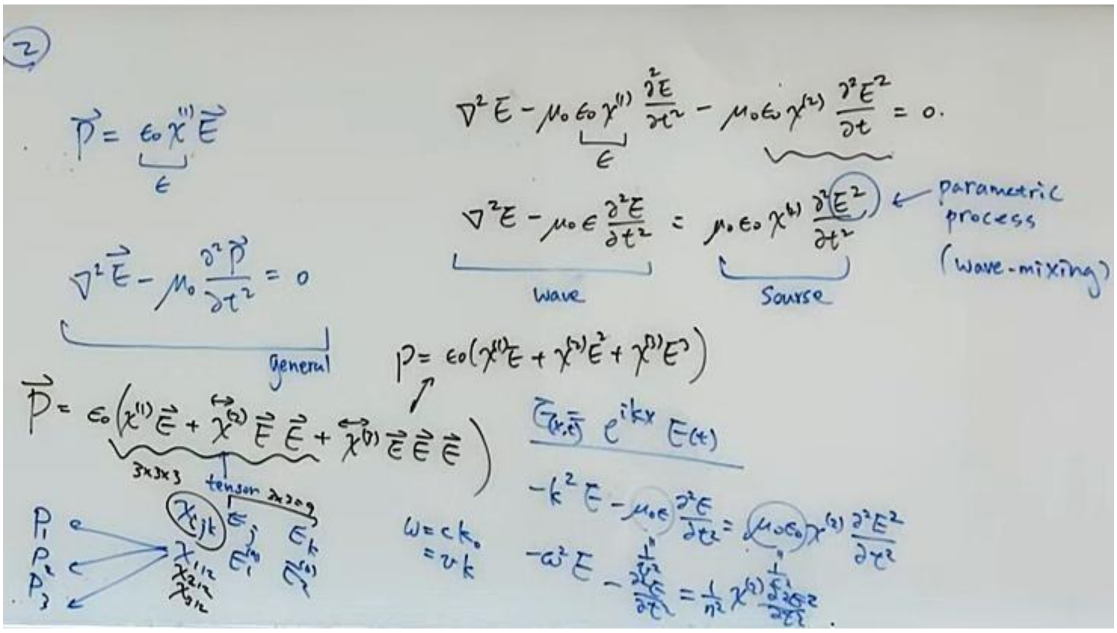
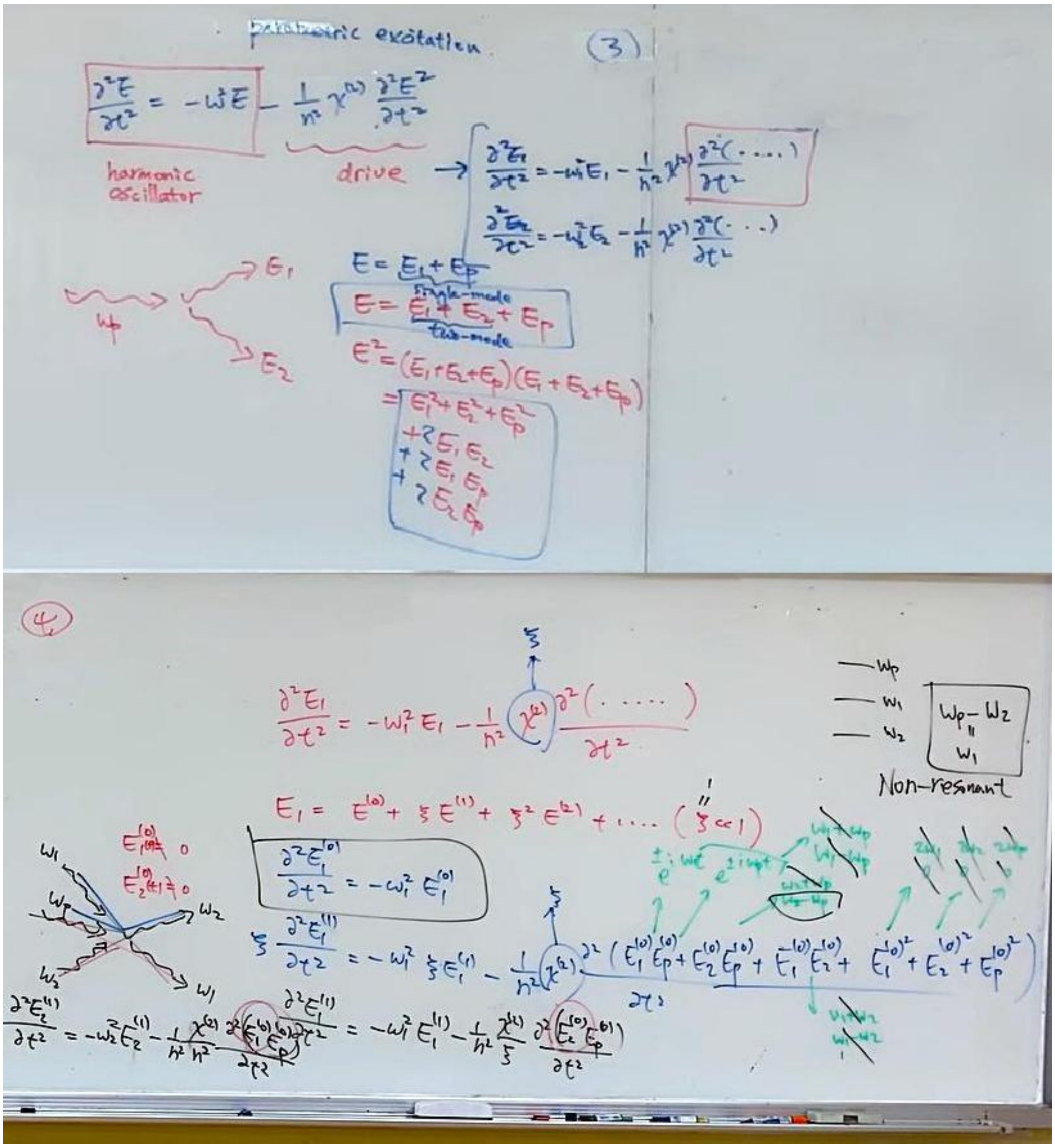
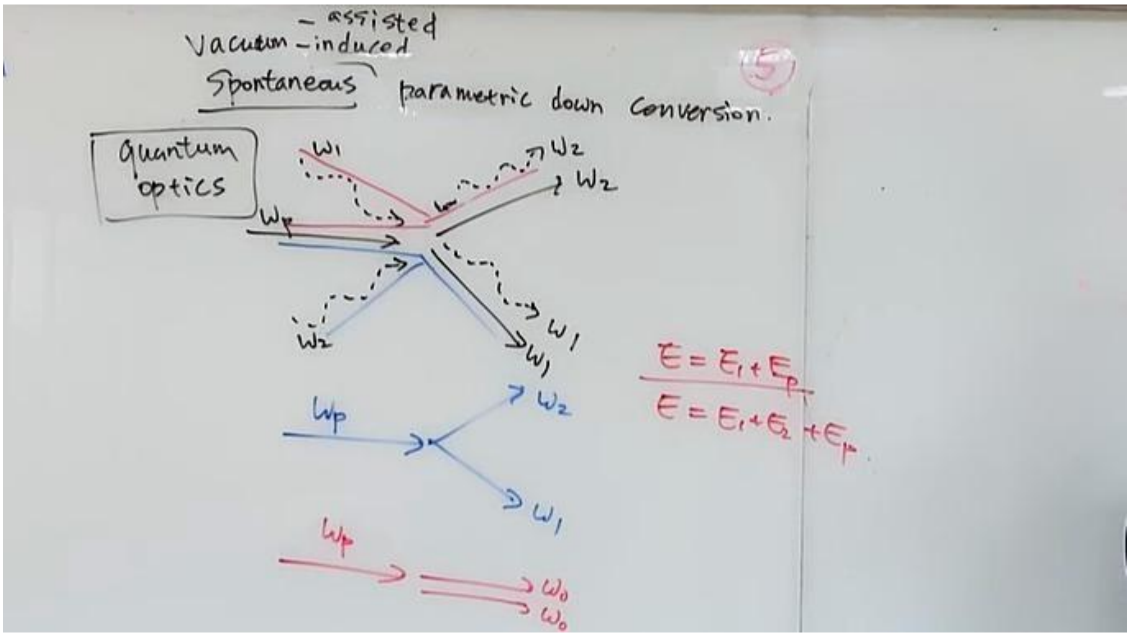
# Lecture8 Single-mode squeezing

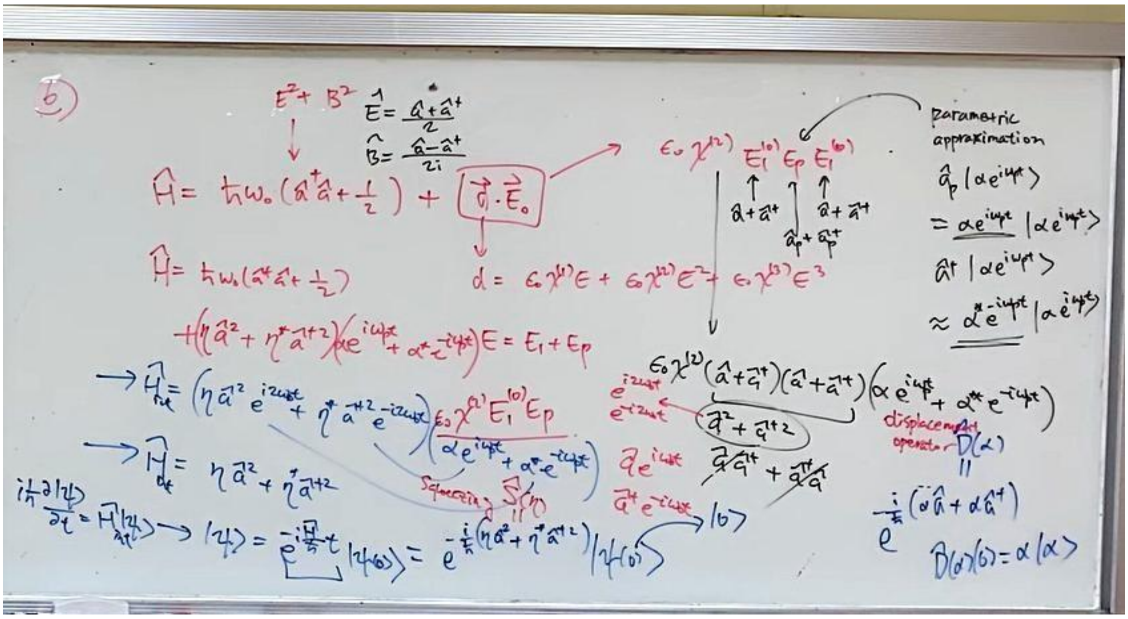


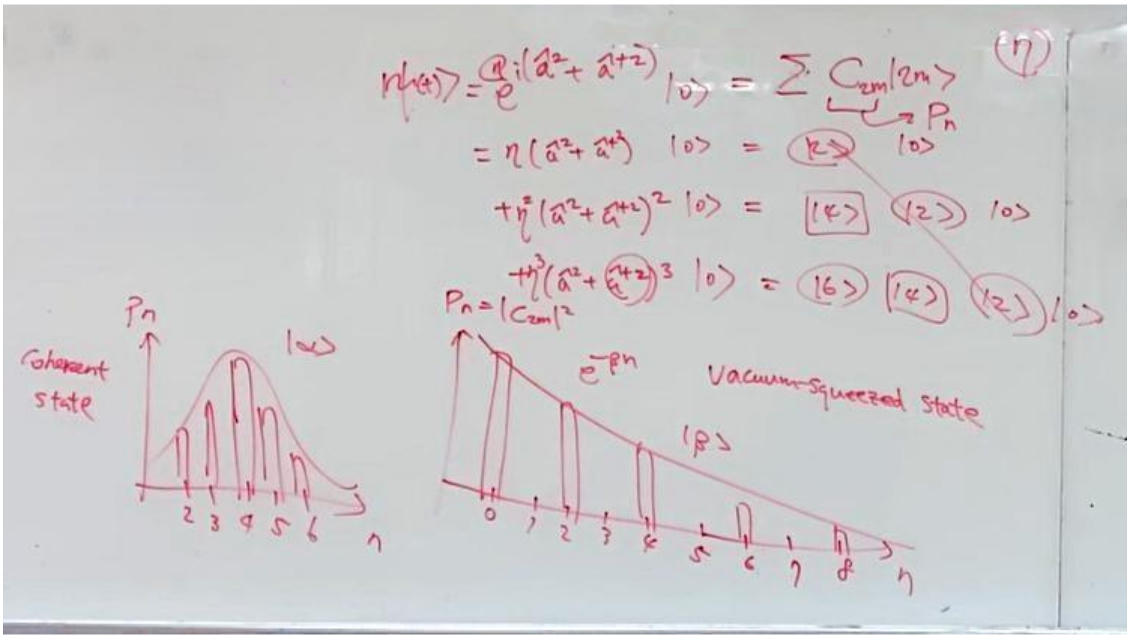


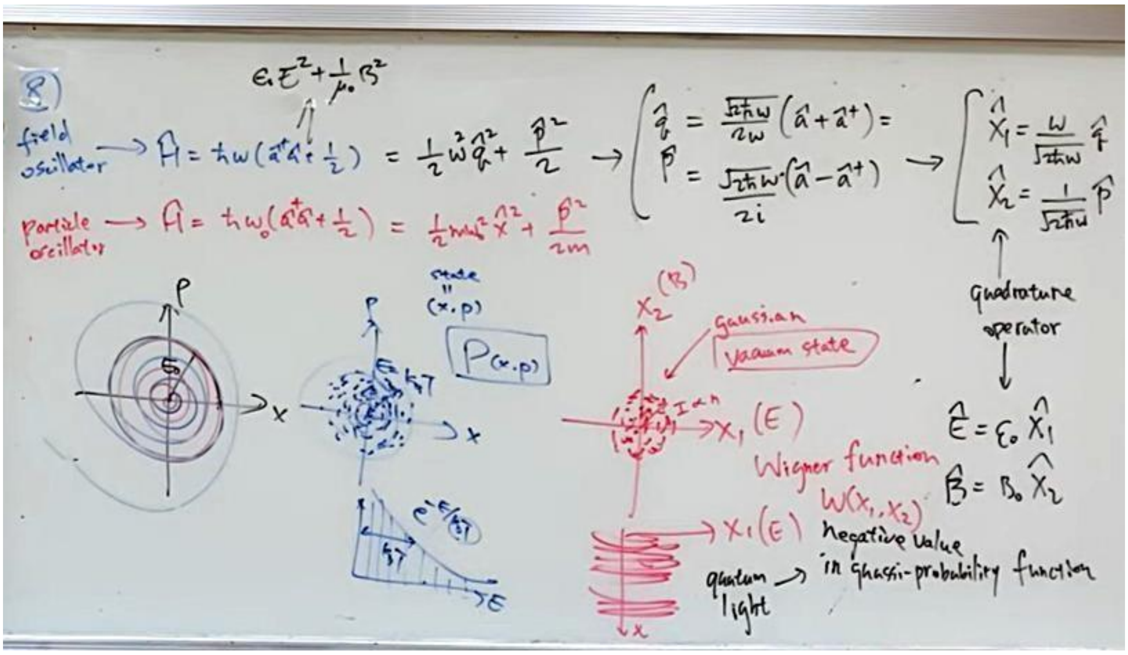


parametric excitation
(3)
harmonic oscillator
drive
single-mode
two-mode
(4)
Non-resonant

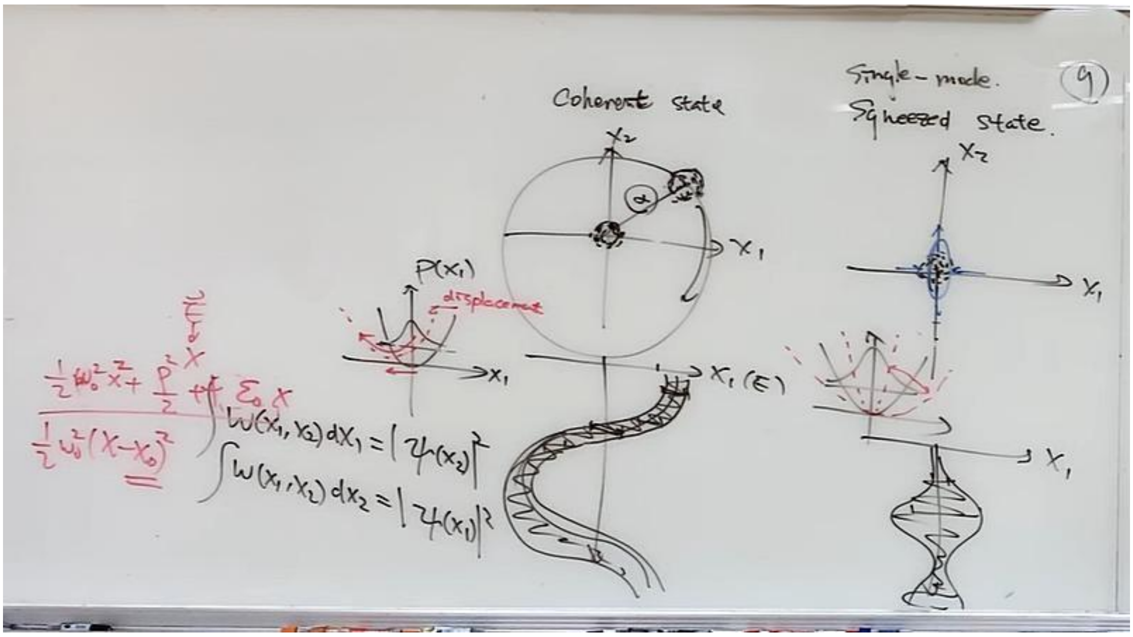

- assisted
Vacuum - induced
Spontaneous parametric down conversion.
quantum optics
$E = E_1 + E_p$
$E = E_1 + E_2 + E_p$

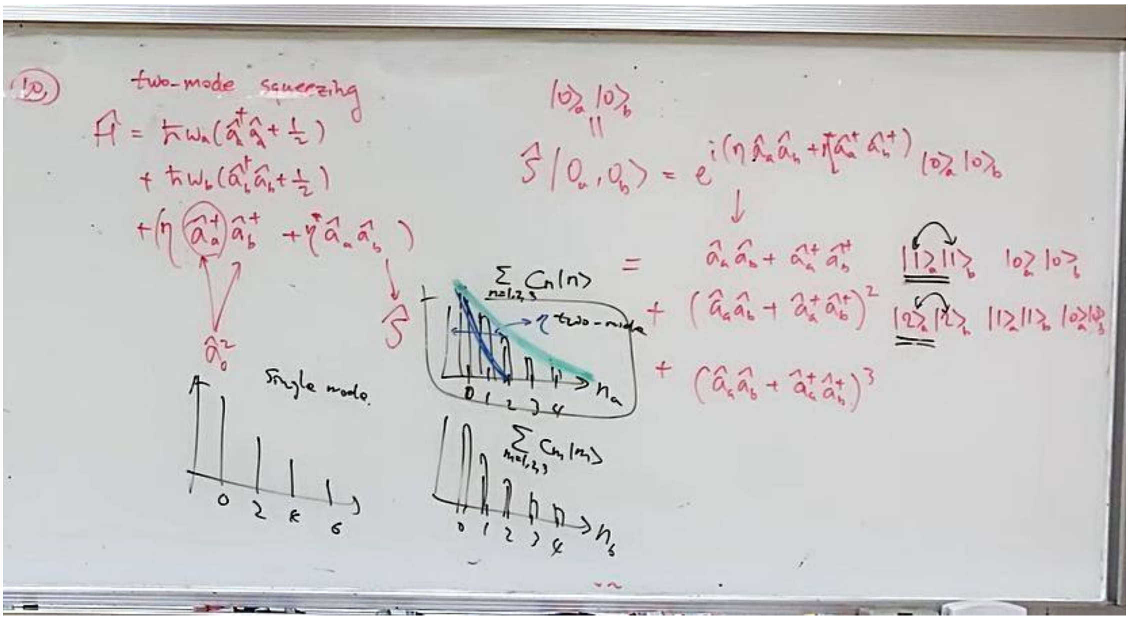

parametric approximation
displacement operator $D(\alpha)$
Squeezing $S(\eta)$
$D(\alpha)|0\rangle = \alpha|\alpha\rangle$

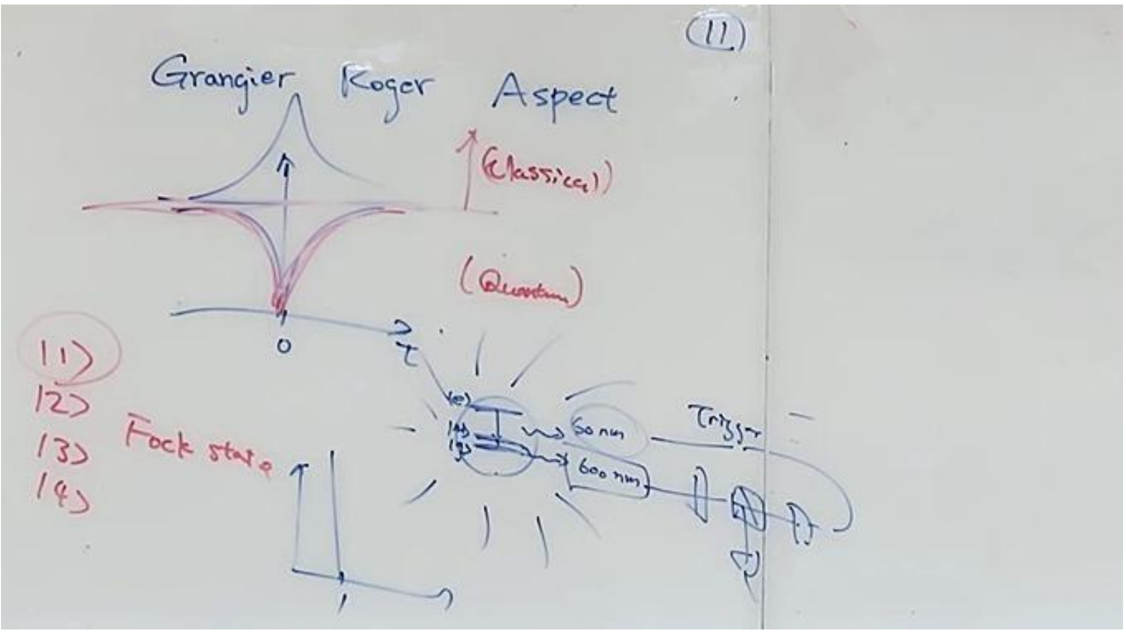


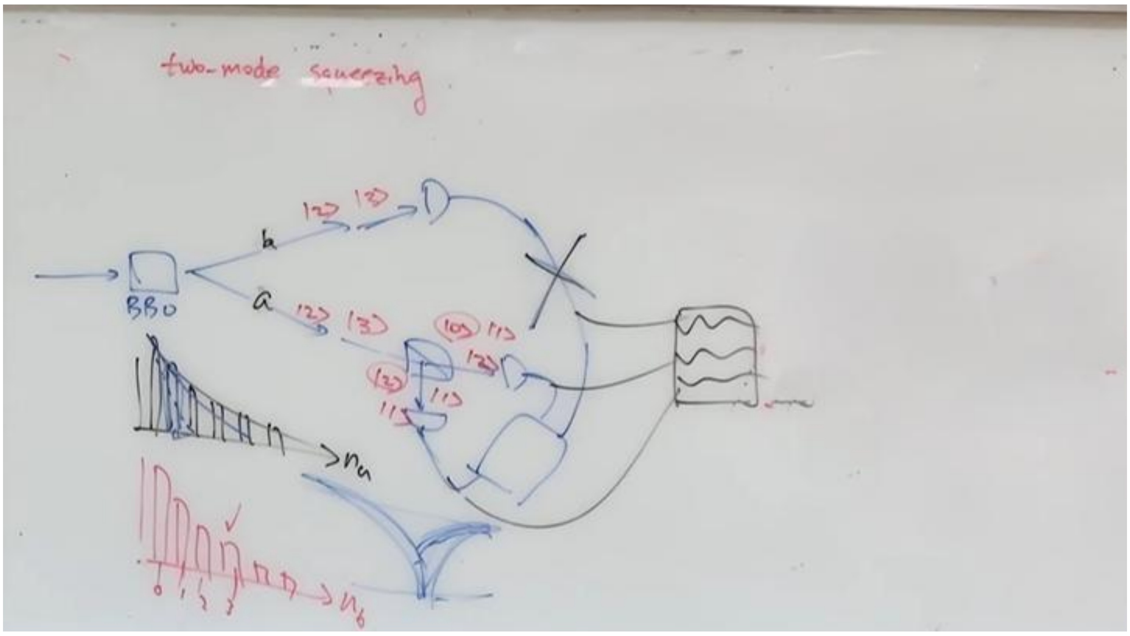

coherent state
Vacuum-squeezed state

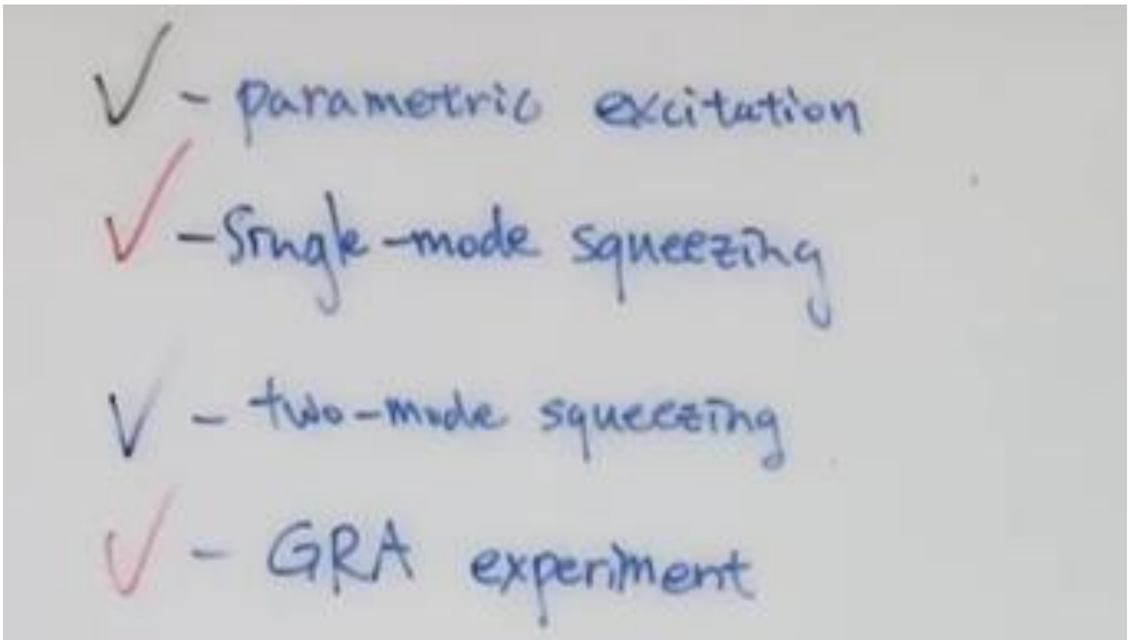

field oscillator
particle oscillator
Gausian
Vacuum state
Wigner function
negative value
in quasi-probability function
quantum light
quadrature operator


Coherent state
Single-mode
Squeezed state
displacement
9


two-mode squeezing
Single mode
two-mode
10


11
Grangier Roger Aspect
(Classical)
(Quantum)
0
|1⟩
|2⟩
|3⟩
|4⟩
Fock state
50 nm
600 nm
Trigger


two-mode squeezing
BBO
b
a
|2⟩ |3⟩
|0⟩ |1⟩
0 1 2 3


✓ - parametric excitation
✓ - single-mode squeezing
✓ - two-mode squeezing
✓ - GRA experiment