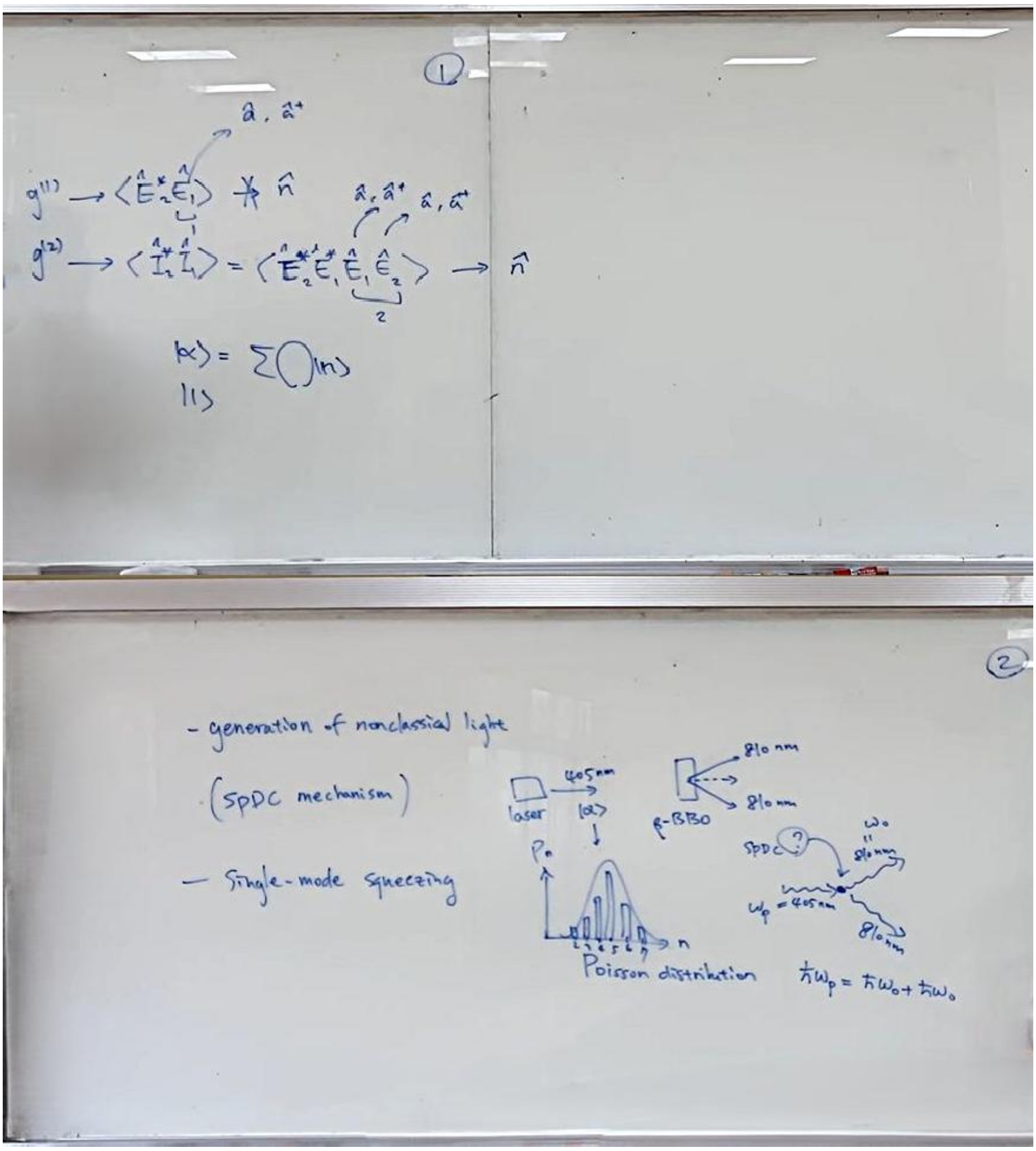
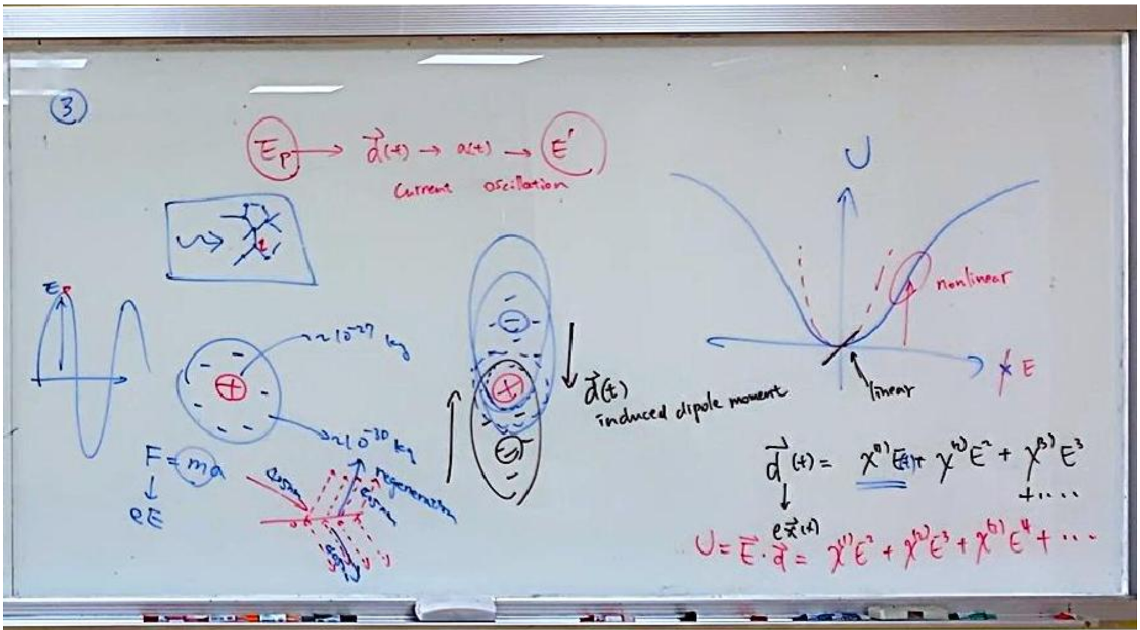
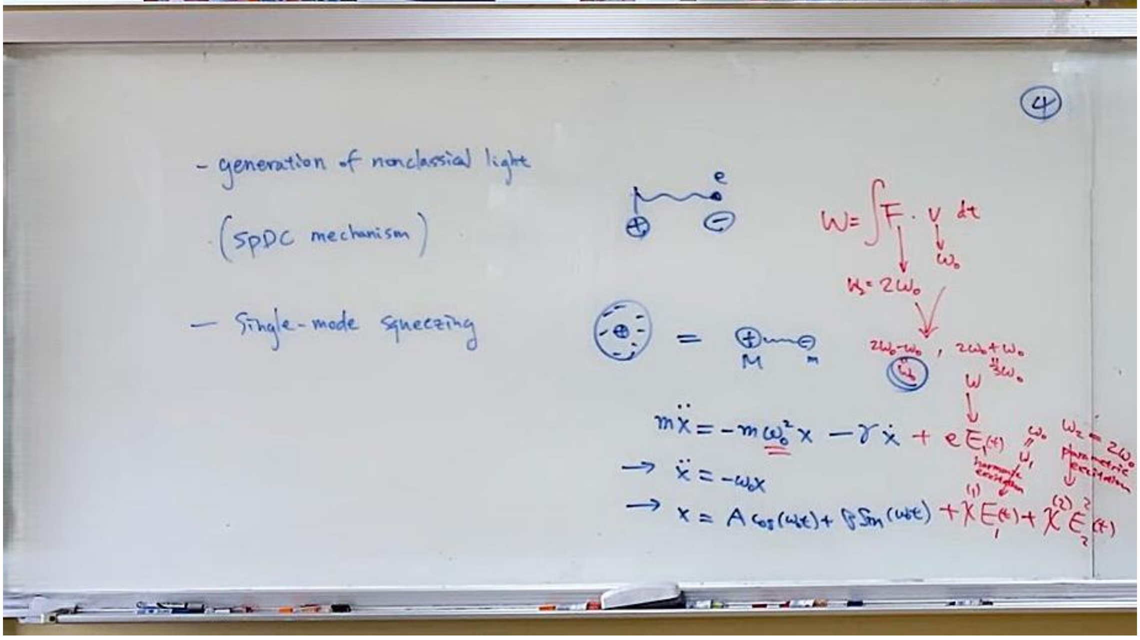
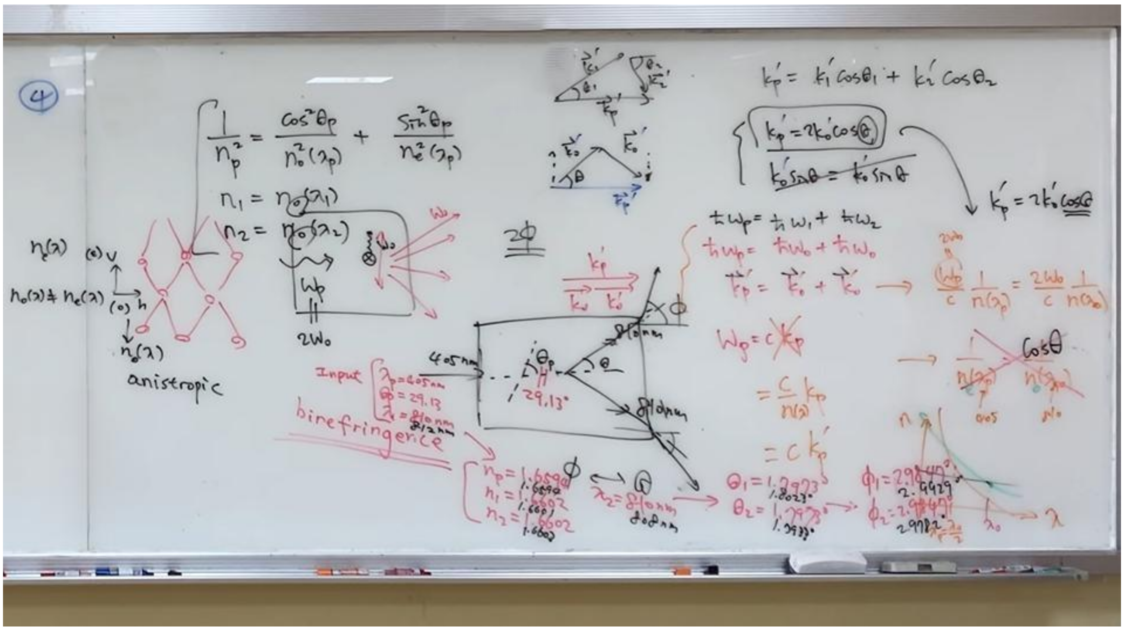
Lecture7 SPDC mechanism




③
current oscillation
~10^{-27} kg
~10^{-30} kg
F = ma
eE
regeneration
induced dipole moment
nonlinear
linear
U
E
$\vec{d}(t) = \chi^{(1)}E(t) + \chi^{(2)}E^2 + \chi^{(3)}E^3 + \dots$
$U = \vec{E}\cdot\vec{d} = \chi^{(1)}E^2 + \chi^{(2)}E^3 + \chi^{(3)}E^4 + \dots$


④
- generation of nonclassical light
(SPDC mechanism)
- Single-mode squeezing
$W = \int F \cdot v\, dt$
$m\ddot{x} = -m\omega_0^2 x - \gamma\dot{x} + eE(t)$
$\ddot{x} = -\omega_0 x$
$x = A\cos(\omega_0 t) + B\sin(\omega_0 t) + \chi^{(1)}E_1(t) + \chi^{(2)}E_2^2(t)$
harmonic oscillation
parametric oscillation


anistropic
binefringence
Input
405nm
810nm
29.13°
$k_p' = k_1' \cos\theta_1 + k_2' \cos\theta_2$
$k_p' = 2k_0' \cos\theta$