

LIGO H1 Interferometer

Arm cavity (4 km)

Vacuum envelope

Arm cavity (4 km)

Beamsplitter

Power recycling mirror

To squeezed vacuum source:
phase lock loop
with PUMP laser

H1 laser

To squeezed vacuum source:
feedback to PUMP laser frequency
for squeezing angle control

Squeezing angle
control photodiode

Output Faraday isolator

Faraday isolator

Output mode cleaner

Output photodiode

Squeezed vacuum &
frequency-shifted control beam

Squeezed vacuum source

Control laser

Frequency-shifted control beam

SHG

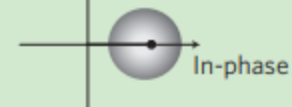
OPO green pump beam

Pump laser

From H1 laser:
phase lock loop
with PUMP laser

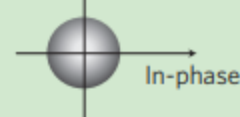
From squeezing angle
control photodiode:
feedback to PUMP
laser frequency

Quadrature
phase



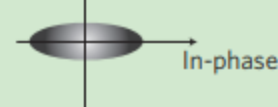
(a) Coherent state of light

Quadrature
phase



(b) Vacuum state

Quadrature
phase



(c) Squeezed vacuum state