Quantum Control of States of Light

Optimization of information extraction from optical measurements

C. Fabre
Laboratoire Kastler Brossel
Université Pierre et Marie Curie-Paris6, ENS

Engineering of Quantum States of Light

Optimization of information extraction from optical measurements

C. Fabre
Laboratoire Kastler Brossel
Université Pierre et Marie Curie-Paris6, ENS

1) A bit of quantum optics : about modes and states

Les Houches 2007 pre-doctoral school
Quantum Optics : from one mode to many modes
Lecture notes available at:
http://hal-sfo.ccsd.cnrs.fr

2) Information extraction from optical measurements

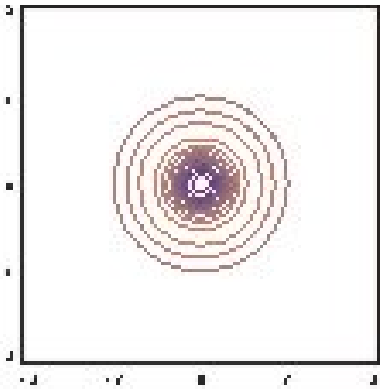
Using optical images

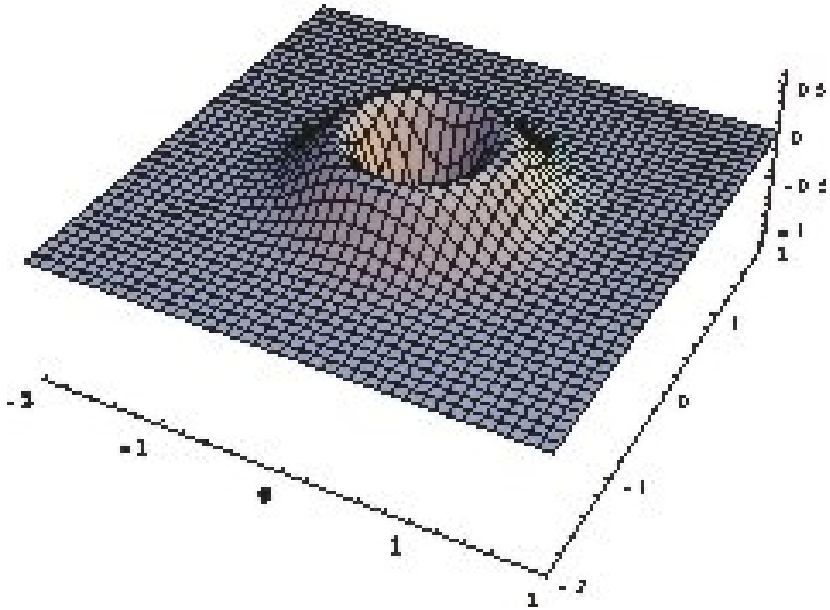
Using trains of light pulses

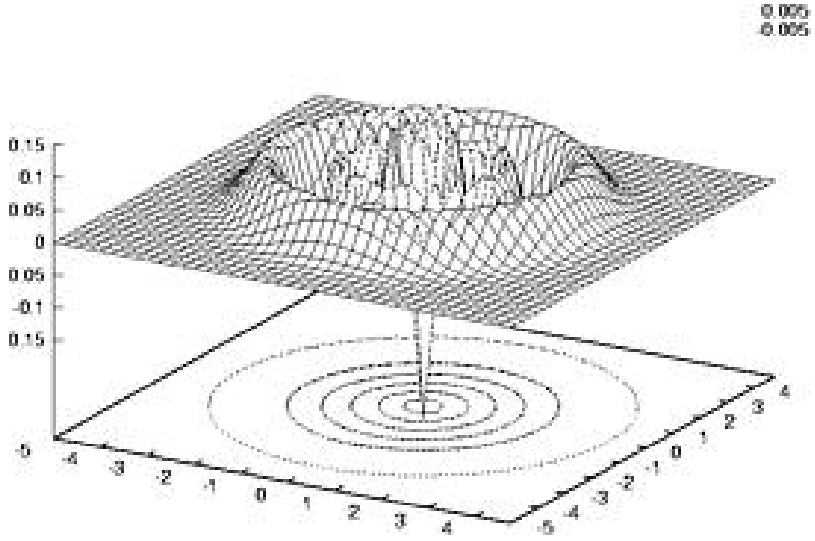
1) Field quantization
on travelling plane wave basis (TPW)

2) Photons in different mode bases

3) A gallery of quantum states of light



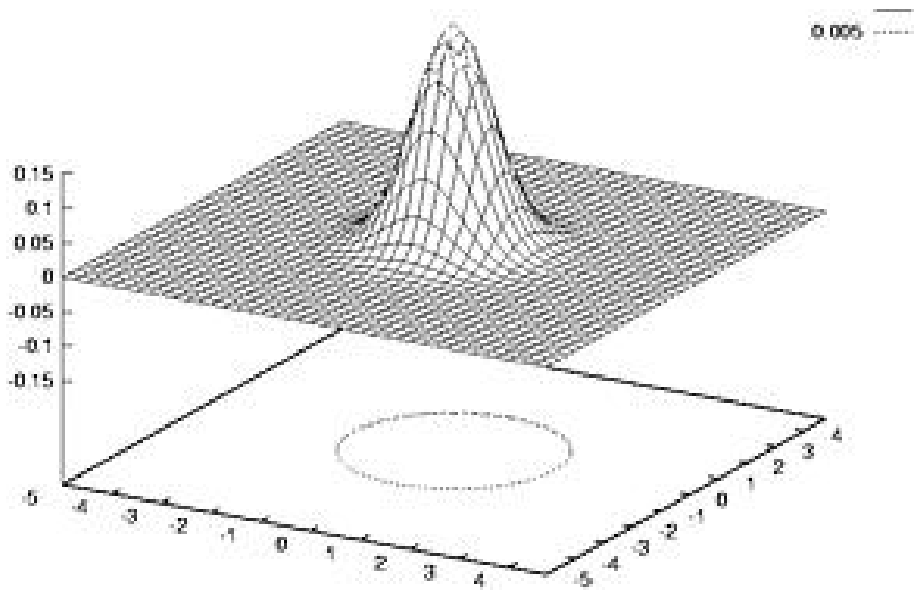




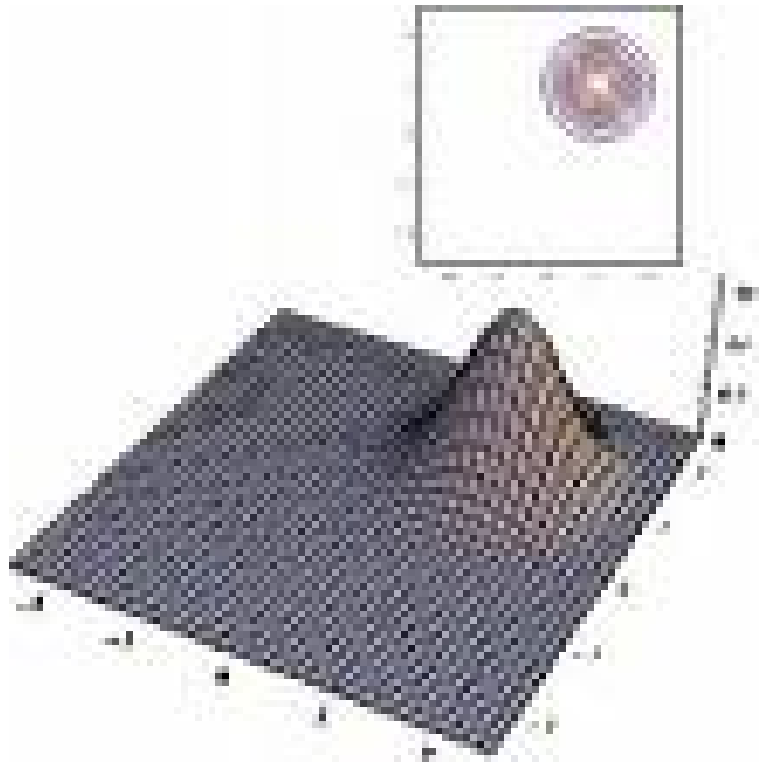
Photon number states

n=1

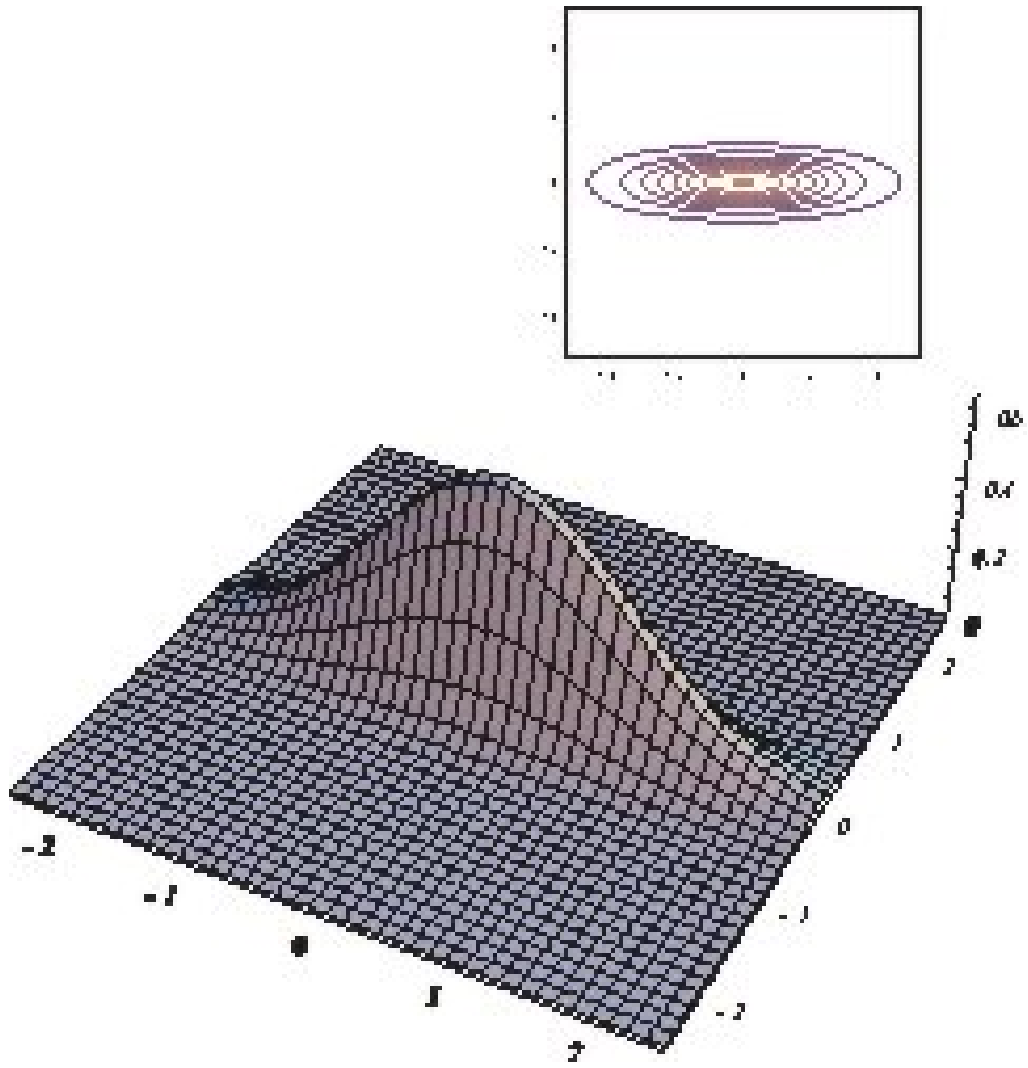
n=2



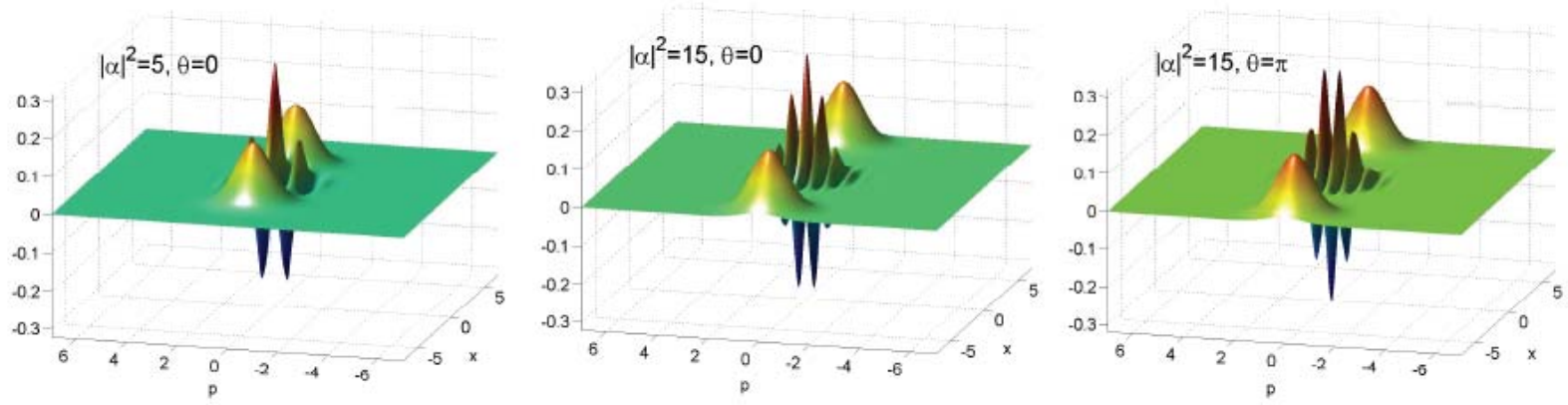
vacuum



Coherent state



Vacuum squeezed state



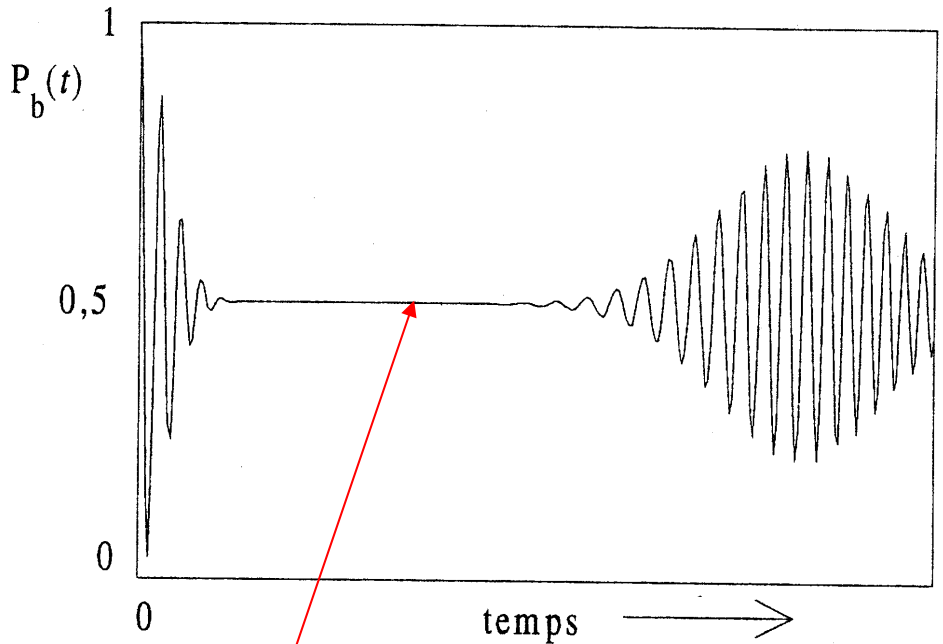
Schrödinger cats

1) Field quantization
on travelling plane wave basis (TPW)

2) Photons in different mode bases

3) A gallery of quantum states of light

4) Generation of quantum states of light



Cat state

1) Field quantization
on travelling plane wave basis (TPW)

2) Photons in different mode bases

3) A gallery of quantum states of light

4) Generation of quantum states of light

5) Intrinsic single mode-states