Program

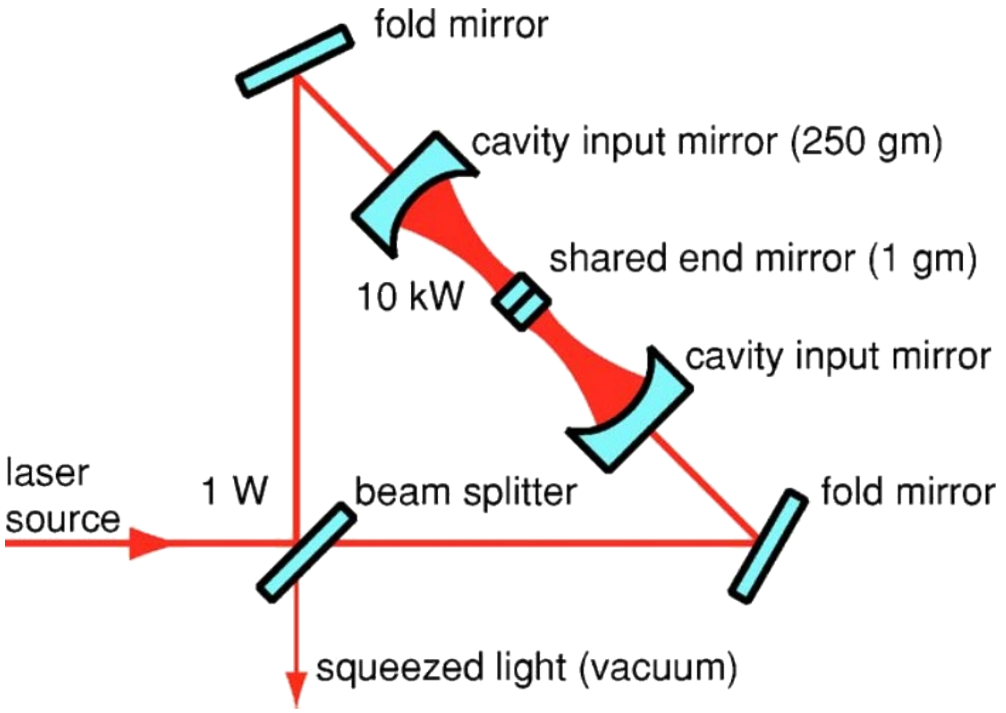
To design a MatLab toolbox aimed at simulating **ponderomotive** sqeezing in linear approximation with symbolic and numeric computations, easy to extend, outputing **Fields**, Quantum and Thermal **noise**.

Assumptions

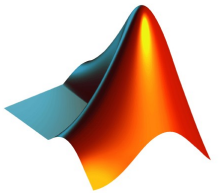
- No CPU-spare
- RAM-eager
- No problem with Time Analysis
- Different code for Sym and Num

Requirements

- Same results Num/Sym
- Parallelizable process
- Frequency domain



Simulator



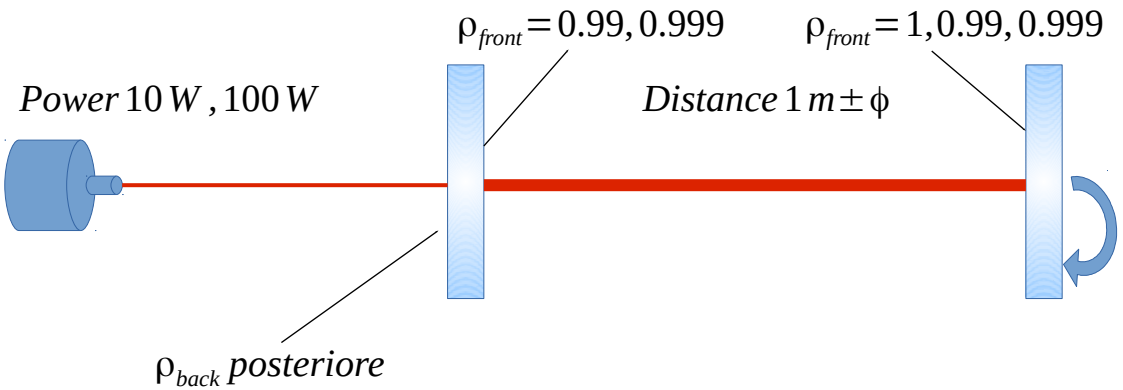
Based on “**Corbit et al, 2005 2006**”

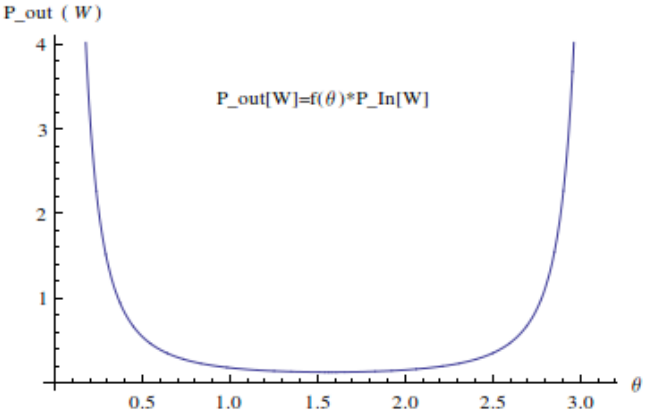
- Classical Field
- Two-Ways formalism
- AC (Radiation pressure)
- Quantum/Thermal Noise
- Numeric computation (MatLab)
- Symbolic computation (Mathematica script)
- Many objects (Laser, Mirror, BeamSplitter, Squeezer)
- Ponderomotive effects
- 20.000 lines of code
- Basic validation with ponderomotive example, described in article

Validation

Simple cavity

- var: θ (Len cavity), ρ (of Mirrors), Power
- Numeric & Symbolic computations agree
- Symbolic computing is slow





$$\vartheta = \frac{\omega * (L - \phi)}{c}$$

$$P_{Out} = \frac{(1 - \rho_{back}^2)}{\rho^2 - 2\rho\cos(2\vartheta)} P_i$$

Numeric Computing:

- Fast
- CPU preserving
- Entirely in MatLab
- Linear Algebra

Symbolic Computing:

- Very Slow
- Memory/Cpu intensive
- Solved via Mathematica script
- Useful for theoretical confrontation