Abstract Submitted
for the DAMOP19 Meeting of
The American Physical Society

Ultra-cold strontium atoms in a high finesse optical micro-cavity[1] LUCAS BGUIN, MATHIEU BERTRAND, TORBEN PPPLAU, JAKOB REICHEL, Laboratoire Kastler Brossel, ENS, CNRS, Sorbonne Universit, 24 rue Lhomond, 75005 Paris, France — The advent of alkaline-earth-like atoms with ultranarrow optical transitions has opened new avenues both in the fundamental study of quantum gases and for the development of state-of-the-art atomic sensors. In recent years, optical clocks based on Sr or Yb have reached unprecedented stability and accuracy at the 10^{-18} level. However, to date, such clocks are ultimately limited by the quantum projection noise due to the absence of correlations between the different atoms. The implementation of quantum metrology schemes using many-body correlated atomic states allows to go around this limitation. A promising path to quantum metrology with neutral atoms is the generation of correlated states using cavity quantum electrodynamics (cQED) methods. In this direction, we present a compact and efficient cQED experiment combining ultracold strontium atoms and high finesse optical micro-cavities.

[1]This work is supported by the ERC Advanced Grant EQUEMI Entanglement and Quantum Engineering with optical Microcavities.

Lucas Bguin
Laboratoire Kastler Brossel, ENS, CNRS, Sorbonne Universite

Date submitted: 06 Feb 2019 Electronic form version 1.4