## Quantum Sensing of Damping Constants and Temperature

J Wang<sup>1</sup>, G S Agarwal<sup>2,3</sup>, and L Davidovich<sup>4</sup>

<sup>1</sup>Department of Physics and Astronomy, Texas A&M University, 77843, College Station TX, USA. Contact Phone: +19798457717

<sup>2</sup>Department of Physics and Astronomy, Texas A&M University, 77843, College Station, TX, USA. Contact Phone: +19798457717

<sup>3</sup>Institute for Quantum Science and Engineering, Texas A&M University, 77843, College Station, TX, USA. Contact Phone: +191798457717

<sup>4</sup>Institute of Physics, Universidade Federal do Rio de Janeiro, 21941-972, Rio de Janeiro, Brazil. Contact Phone: +5521991431530

Contact Email: Idavid@if.ufrj.br

Quantum precision limits are determined for the estimation of damping constants and the temperature of lossy bosonic channels. A direct application would be the use of light for the estimation of the absorption and the temperature of a transparent slab. In both damping and temperature estimates, sequential prethermalization measurements through a stream of single bosons may lead to a huge gain in precision.