

Marco Genoni

Imperial College London South Kensington Campus
SW7 2AZ London, United Kingdom
m.genoni@imperial.ac.uk

Quantum feedback control of mechanical squeezing

M.G. Genoni, M. Bina, S. Olivares, G. De Chiara, M. Paternostro

We propose and demonstrate a simple feedback control mechanism for the squeezing of a quantum harmonic oscillator embodied by the phononic mode of a mechanical oscillator. Our proposal is based on frequent repeated measurements and re-initialisation of the state of a two-level system ancilla that interacts with the oscillator. We demonstrate that the steady-state of the mechanical mode can be significantly squeezed with such a simple, non-adaptive feedback loop, which offers interesting possibilities for quantum state engineering and feedback-based state steering in an explicitly open-system scenario.

[1] M. G. Genoni et al., to appear soon on the arXiv