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[401] Ultra-low quantum decoherence nano-optomechanical systems

Tuesday 5 September 2023 14:00 (30 minutes)

Thermal motion of a room-temperature mechanical resonator typically dominates the quantum backaction of its position measurement. Optomechanics provides a path towards quantum control of the mechanical motion by dominating the thermal effects with optical backaction. In this work we design, fabricate, and characterize three different classes of nanomechanical resonators with Q factors exceeding 3 billion at room temperature and demonstrate their optical readout using an integrated nearfield nano-optomechanical transducer using high stress silicon nitride. Our approach allows individual optimization of optical and mechanical resonators, while maintaining a high optomechanical coupling rate.

Theoretical Work

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