

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Optical cooling of a 122 kHz mechanical resonator EVAN JEFFREY, PETRO SONIN, University of Leiden, DUSTIN KLECKNER, BRIAN PEPPER, University of California, Santa Barbara, DIRK BOUWMEESTER, University of Leiden — We demonstrate radiation pressure cooling of a 122-kHz, 60-ng mechanical resonator in an optical cavity. We use a dilution refrigerator to achieve a low base temperature (< 100 mK). The resonators consist of high reflectivity mirrors suspended on a stressed silicon nitride cross resonator. Due to their low frequency, high Q (> 40000) and high finesse (> 10000) these devices are excellent candidates for demonstrating quantum behavior of macroscopic systems, with the possibility of achieving quantum superpositions, entanglement with external degrees of freedom, and studying exotic decoherence mechanisms.

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Date submitted: 26 Nov 2010

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