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Trampoline Resonator Fabrication for Tests of Quantum Mechanics at High Mass MATTHEW WEAVER, BRIAN PEPPER, Univ of California - Santa Barbara, PETRO SONIN, HEDWIG EERKENS, FRANK BUTERS, SVEN DE MAN, Huygen's Laboratory-Leiden University, DIRK BOUWMEESTER, Univ of California - Santa Barbara, Huygen's Laboratory-Leiden University — There has been much interest recently in optomechanical devices that can reach the ground state. Two requirements for achieving ground state cooling are high optical finesse in the cavity and high mechanical quality factor. We present a set of trampoline resonator devices using high stress silicon nitride and superpolishing of mirrors with sufficient finesse (as high as 60,000) and quality factor (as high as 480,000) for ground state cooling in a dilution refrigerator. These devices have a higher mass, between 80 and 100 ng, and lower frequency, between 200 and 500 kHz, than other devices that have been cooled to the ground state, enabling tests of quantum mechanics at a larger mass scale.

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