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【473】Magneto-mechanical coupling between a macroscopic cantilever and a superconducting cavity

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Preparing a massive oscillator near the quantum limit has become a central goal in fundamental sciences.Optomechanics, where a mechanical mode is coupled to a light field, allows to operate a mechanical object near its quantum ground state. Our setup consists out of a microwave SQUID based cavity inductively coupled to a mechanical cantilever.Despite being deeply in the unresolved sideband regime, we can use the intrinsic nonlinearity of our cavity originating from the SQUID for enhanced cooling. We demonstrate that our system outperforms an identical linear system by more than one order of magnitude.Currently we reduce the thermal population of the cantilever by a factor of 350, to around 11 phonons.

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