Title:	Macroscopic quantum oscillator based on a flux qubit
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Abstract:	In this paper a macroscopic quantum oscillator is proposed, which consists of a flux-qubit in the form of a cantilever. The net magnetic flux threading through the flux-qubit and the mechanical degrees of freedom of the cantilever are naturally coupled. The coupling between the cantilever and the magnetic flux is controlled through an external magnetic field. The ground state of the flux-qubit-cantilever turns out to be an entangled quantum state, where the cantilever deflection and the magnetic flux are the entangled degrees of freedom. A variant, which is a special case of the flux-qubit-cantilever without a Josephson junction, is also discussed.
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