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Reading, writing and squeezing the entangled states of two nanomechanical resonators coupled to a SQUID GUY COHEN, MASSIMILIANO DI VENTRA, University of California, San Diego — We study a system of two nanomechanical resonators embedded in a dc SQUID. We show that the inductively-coupled resonators can be treated as two entangled qubits with states that can be read from, or written on by employing the SQUID as a displacement detector or switching additional external magnetic fields, respectively. We present a scheme to squeeze the even mode of the state of the resonators and consequently reduce the noise in the measurement of the magnetic flux threading the SQUID. We finally analyze the effect of dissipation on the squeezing using the quantum master equation, and show the qualitatively different behavior for the weak and strong damping regimes. Our predictions can be tested using current experimental capabilities.

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