

Abstract Submitted
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Design and construction of a cavity electro-opto-mechanical system ROBERT PETERSON, REED ANDREWS, THOMAS PURDY, JILA - University of Colorado and NIST, and Department of Physics, University of Colorado, Boulder, KATARINA CICAK, RAYMOND SIMMONDS, National Institute of Standards and Technology, Boulder, Colorado, CINDY REGAL, KONRAD LEHNERT, JILA - University of Colorado and NIST, and Department of Physics, University of Colorado, Boulder — The parallel advances in the fields of electromechanics and optomechanics have raised the prospect of coupling mechanical motion to both electrical and optical fields. Such a hybrid device has many applications, including transduction of quantum information between microwave and optical frequencies. We demonstrate a cavity electro-opto-mechanical device with a mechanical resonator formed by a thin Si_3N_4 membrane. Partial metallization of the membrane with niobium completes a superconducting electrical circuit fabricated using a “flip-chip” technique. This package is integrated into a free-space high-finesse Fabry-Perot cavity, whose spatial mode interacts with the non-metallized portion of the membrane. We report on device performance and discuss future directions for design of hybrid electro-opto-mechanical devices.

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