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Electro-optical transduction via a mechanical membrane COREY STAMBAUGH, JOHN LAWALL, NIST — Both cavity opto-mechanics and cavity electro-mechanics have been studied as means to achieve ground state cooling of mechanical systems. Recent focus has turned to hybrid systems that attempt to convert photons between microwave and optical frequencies through mechanical transduction. This should allow quantum information stored in an electrical cavity to be transferred optically over longer distances. In this talk we describe our hybrid system, a silicon nitride membrane that is coupled to a piezoelectric element and placed within a high finesse Fabry-Perot cavity. This setup allows us to both sense and perturb the mechanical motion of the membrane. Results regarding the coupling between the different domains and the design strategies to optimize these couplings will be discussed.

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