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Single Crystal Diamond Mechanical Resonators[1] PREETI OVARTCHAIYAPONG, BRYAN MYERS, PAUL LAURIA, ANIA BLESZYNSKI JAYICH, University of California Santa Barbara — We report on the fabrication and measurement of single crystal diamond mechanical resonators. This is an important step towards realizing diamond photonics, optomechanics, and diamond-based scanning magnetometers. We present measurements of mechanical quality factors in excess of 10,000 as well as estimates of the coupling to embedded nitrogen-vacancy (NV) centers through strain. Strain tuning the NV's zero-phonon line could facilitate coupling its spin state to a photonic network. We also discuss strain as a coupling mechanism between the spin and mechanical degree of freedom in a diamond based resonator.

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Preeti Ovartchaiyapong
University of California Santa Barbara

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