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A THz Microcavity with a Phononic Cavity Polariton HADLEY LAWLER, Naval Research Laboratory, SANJIV SHRESTA, NIST, GAVIN BRENNEN, NIST — Polaritons were originally considered within the context of the dielectric response of bulk systems, and its relation to the dispersion of fundamental solid-state excitations, such as excitons and optical phonons. More recently, excitonic cavity polaritons have been theoretically described and observed. These excitonic cavity polaritons represent a tunable Rabi coupling between a condensed matter excitation within a microstructure and a cavity-resonant electromagnetic mode. Like excitons, optical phonons possess well-characterized cross-sections with the electromagnetic field, but at lower energies and larger length and time scales. We present theory relevant to a phononic cavity polariton, discuss the prospects for the observation of such a system, and detail our progress toward the prediction of the Rabi coupling's variation with tunable parameters. While susceptibility-type measurements are a possible route for the detection of such a system, we emphasize the possibility of measuring the Rabi oscillation directly in the time domain using ultrafast lasers.

Hadley Lawler
Naval Research Laboratory

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