

Abstract Submitted
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Sound and Noisy Light: Optical Control of Phonons in Photo-switchable Structures¹ SOPHIA SKLAN, JEFFREY GROSSMAN, Massachusetts Inst of Tech-MIT — We present a novel means of controlling phonons via optical tuning. Taking as a model an array of photoresponsive materials (photo-switches) embedded in a matrix, we numerically analyze the vibrational response of an array of bistable harmonic oscillators with stochastic spring constants. Changing the intensity of light incident on the lattice directly controls the composition of the lattice and therefore the speed of sound. Furthermore, modulation of the phonon bandstructure at high frequencies results in a strong confinement of phonons. The applications of this regime for phonon wave-guides, vibrational energy storage, and phononic transistors is examined.

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