

Abstract Submitted  
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**Coherent Manipulation of Phonons at the Nanoscale SHANGJIE**

YU, MIN OUYANG, Department of Physics, University of Maryland, College Park — Phonons play a key role in almost every physical process, including for example dephasing phenomena of electronic quantum states, electric and heat transports. Therefore, understanding and even manipulating phonons represent a pre-requisite for tailoring phonons-mediated physical processes. In this talk, we will first present how to employ ultrafast optical spectroscopy to probe acoustic phonon modes in colloidal metallic nanoparticles. Furthermore, we have developed various phonon manipulation schemes that can be achieved by a train of optical pulses in time domain to allow selective control of phonon modes. Our theoretical modeling and simulation demonstrates an excellent agreement with experimental results, thus providing a future guideline on more complex phononic control at the nanoscale.

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