

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Coherent phonon modulation by nanoscale acoustically mismatched interface SHANGJIE YU, MIN OUYANG, Univ of Maryland-College Park — Precise engineering of phonon spectrum by material design is essential for in-depth understanding of fundamental physical phenomena as well as new technology breakthrough. When phonons propagate through two different constituents, their mismatched interface can coherently modulate phonon spectrum. In this talk, we will demonstrate the phonon characteristics can be precisely tailored through nanoscale interfacial coupling by investigating acoustically mismatched core-shell hetero-nanostructures with ultrafast pump-probe technique. Coherent phonon coupling between core and shell through their interface has been experimentally revealed, which agrees well with theoretical simulation. This interfacial phonon coupling also represents a unique fingerprint of complex nanostructures.

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Date submitted: 14 Nov 2014

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