

Abstract Submitted
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Lattice Dynamics Simulations of Phonon Thermal Conductivity in SiGe Alloys SHANG-FEN REN, WEI CHENG¹, Illinois State University — Thermoelectric Properties of SiGe alloys and Si/SiGe alloy superlattices have attracted a great research attention in recent years because their potential applications in thermoelectric devices and other applications. By using a microscopic lattice dynamics model developed to investigate phonon properties in semiconductor nanostructures, we have calculated phonon thermal conductivities of Si/Ge superlattices in both the growth and in-plane directions [1]. In this research, we have calculated the phonon thermal conductivity of SiGe alloy with various alloy compositions at different temperatures. The calculated results are compared with available experimental measurement [2] with good agreement. We are expecting that these calculations can help with the searching for the most efficient thermoelectric materials for various applications. References: 1. Lattice Dynamics Investigations of Phonon Thermal Conductivity of Si/Ge Superlattices with Rough Interfaces, S.F. Ren, W. Cheng, G. Chen, *J. Appl. Phys.* (in print 2006). 2. The influence of the composition of SiGe mixed crystals on thermal diffusivity photoacoustic approach, A. Patrin, N. Abrosimov, M. Maliński, L. Bychto, *Solar Energy Materials & Solar Cells* 72 (2002) 579.

¹On leave from Beijing Normal University

Shang-Fen Ren
Illinois State University

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