

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Electro-Raman measurement of thermal conductivity of suspended single and few-layer graphene¹ LUIS A. JAUREGUI, JIUNING HU, GABRIEL A. LOPEZ, School of Electrical and Computer Engineering, Birck Nanotechnology Center, Purdue University, ROMANEH JALILIAN, Department of Physics, Birck Nanotechnology Center, Purdue University, QINGKAI YU, Center of Advanced Materials and Department of Electrical and Computer Engineering, University of Houston, ZHIGANG JIANG, School of Physics, Georgia Institute of Technology, YONG P. CHEN, Department of Physics, Birck Nanotechnology Center. School of Electrical and Computer Engineering, Purdue University — We present measurements of the thermal conductivity of suspended graphene, using Raman spectroscopy on graphene subject to electrical heating. Joule heating is generated by passing a current through the suspended graphene, while the Cr/Au contact leads act as heatsinks. Raman spectrum is used as a thermometer for graphene, because of the temperature dependence of the amplitude and frequency for the G and 2D peaks. In order to extract the thermal conductivity of graphene, we measure the temperature distribution on the suspended graphene by Raman mapping of the 2-D and G peaks with graphene driven by various heating current. We can also determine the temperature dependence of the thermal conductivity. Our technique provides a simple method to measure thermoconductivity of graphene and can be generalized to other nanomaterials.

¹This research is supported by the Nanoelectronics Research Initiative (NRI)

Luis A. Jauregui
School of Electrical and Computer Engineering,
Birck Nanotechnology Center, Purdue University

Date submitted: 10 Dec 2009

Electronic form version 1.4