Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Electron-phonon interactions in bilayer graphene HELI VORA, NIST-Boulder, XU DU, Department of Physics and Astronomy, Stony Brook University — We report measurements on electron thermal conductance in bilayer graphene due to cooling via phonons. The measurements were carried out using bilayer graphene-superconductor tunnel junctions, where the superconducting contacts effectively confine the hot electrons inside the graphene channel, allowing access to phonon cooling at low temperatures. We show results on the temperature and doping dependence of the cooling power in bilayer graphene. Contrary to what was observed in monolayer graphene, the phonon cooling power decreases with increasing carrier density in bilayer graphene. The temperature dependence of the phonon cooling power can be described by a power law with a power factor ~ 5, again, qualitatively different from the T^3 temperature dependence observed in the disordered monolayer graphene. These new results may shed light on the dominating mechanisms for hot electron cooling bilayer graphene.

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Date submitted: 14 Nov 2014 Electronic form version 1.4