Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

**Thermopower of graphene and the validity of Mott's formula** FERESHTE GHAHARI, Physics Department, Columbia University, TAKASHI TANIGUCHI, KENJI WATANABE, Advanced Materials Laboratory, National Institute for Materials Science, Japan, PHILIP KIM, Physics Department, Columbia University — Thermoelectric power (TEP) of graphene is previously measured in the disorder limited transport regime where the semiclassical Mott relation agrees with experimental data. In this presentation, we report the TEP measurement on graphene samples deposited on hexagonal boron nitride substrates where drastic suppression of disorder is achieved. Our results show that at high temperatures the measured thermopower deviates from Mott relation and this deviation is greater for higher mobility samples. We quantify this deviation in both degenerate and non-degenerate regime using Boltzmann transport theory considering different scattering mechanisms in the system.

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Date submitted: 15 Nov 2013 Electronic form version 1.4