## Abstract Submitted for the MAR16 Meeting of The American Physical Society

Thermoelectric Transport Measurements of Graphene on hBN<sup>1</sup> JUNXI DUAN, Department of Physics and Astronomy, Department of Mechanical Engineering, XIAOMING WANG, Department of Mechanical Engineering, GUO-HONG LI, XINYUAN LAI, Department of Physics and Astronomy, MONA ZE-BARJADI, Department of Mechanical Engineering, Rutgers University, EVA Y. ANDREI, Department of Physics and Astronomy, Rutgers University — The unique electronic transport properties of graphene, arising from massless charge carriers whose sign and density can be tuned by gating, have been studied extensively. Much less work was devoted to graphene's thermal properties. Unlike electrical transport which depends on total carrier density, the thermopower is determined by the net charge transferred and not by the carrier density. This leads to profound differences between the two phenomena. For example, when the Fermi level is close to the Dirac point (DP) where electron-hole (e-h) puddles are populated symmetrically, the electron and hole contributions to the thermopower cancel out. In contrast, their contributions to the electrical current add up. We studied the thermoelectric properties of high quality graphene supported on an hBN substrate, where the e-h puddle regime is significantly reduced compared to that on SiO<sub>2</sub> substrates, which allows closer access to the DP. At room temperature we find that the maximum Seebeck coefficient close to the DP reaches up to twice the values on  $SiO_2$  substrates. Upon cooling down to 77K it decreases in a non-linear fashion with temperature. We will discuss possible origins of this behavior.

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