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Spatially-resolved thermopower of graphene: role of boundary and defects JEWOOK PARK, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, GUOWEI HE, RANDALL FEENSTRA, Department of Physics, Carnegie Mellon University, AN-PING LI, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory — We show a spatially-resolved thermopower of graphene on epitaxial graphene of SiC using a scanning tunneling microscopy (STM) method. A temperature difference between the tip and sample induces a thermovoltage, and it reflects a local variation of thermopower with atomic resolution. The epitaxial graphene shows a high thermoelectric power of 42 uV/K with a large change (9.6uV/K) at the monolayer-bilayer boundary. Since the thermovoltage is proportional to the logarithmic derivative of the local density of the state of sample, the thermovoltage map is sufficiently sensitive to distinguish electronic properties at the boundaries and defects. For instance, a thermovoltage map discloses a Fermi level shift toward the Dirac point near the step edge and long-wavelength Friedel oscillations of the bilayer terrace adjacent to the step. As a result, the thermopower distribution measurement with STM allows probing of the electronic, thermoelectric, and structural properties down to the individual defect level [1]. [1] Jewook Park et al., Nano Lett., 13 3269 (2013)

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