

Abstract Submitted
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Ballistic Transport of Narrow-Channeled Epitaxial Graphene¹

TIAN SHEN, PEIDE YE, YANG SUI, YANQING WU, MIKE CAPANO, JAMES COOPER, LEONID ROKHINSON, Purdue University, LLOYD ENGEL, NHMFL — Large-area epitaxial graphene film by thermal decomposition of SiC wafer has provided the missing pathway to a viable electronics technology ². Low temperature magneto-transport properties of narrow-channeled epitaxial graphene films with dimension of 100 nm to 500 nm, formed on the carbon face of semi-insulating 4H-SiC substrates in an Epigress VP508 SiC hot-wall chemical vapor deposition reactor, are systematically studied. Typical quasi-ballistic transport features, such as negative magnetoresistance or 1D weak localization, aperiodic magnetoresistance fluctuations, periodic magnetoresistance oscillations associated with channel geometry, bend resistance and quench of Hall effect associated with nanoscale junctions, are all observed. Magneto-resistance, being independent on parallel magnetic field up to 18 T, verifies the 2D nature of epitaxial graphene. 2. C. Berger et al., *Science* 312, 1191 (2006).

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