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Spin Filtering in Graphene Magnetic Tunnel Junctions ENRIQUE D. COBAS, ADAM L. FRIEDMAN, OLAF M. J. VAN 'T ERVE, BEREND T. JONKER, U.S. Naval Research Laboratory — We present experimental measurements of spin filtering across ferromagnet-graphene-ferromagnet tunnel junctions. These junctions are predicted to yield nearly 100% spin-polarized charge currents [1,2] and were previously shown to sustain spin-polarized tunnel currents at room temperature [3]. In this work, high-quality multi-layer graphene was synthesized directly on crystalline (111) close-packed ferromagnetic thin films by chemical vapor deposition. All deposition and patterning steps employed standard, wafer-scale photolithography, deposition and ion milling techniques. The charge transport and spin transport across the junctions were measured in a four-probe geometry as a function of applied magnetic field and temperature ranging from 5K to 500K. The signature of minority-pass spin filtering with a low-resistance anti-parallel state is evident throughout the temperature range studied. [1] Karpan et al., Phys. Rev. Lett. 99, 176602, 2007 [2] Yazyev and Pasquarello, Phys. Rev. B. 80, 035408, 2009 [3] Cobas et al., Nano Letters 12, 3000, 2012.

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