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Magnetic profile of a graphene wrapped ferromagnetic surface TIMOTHY CHARLTON, Science Technology Facilities Council, DAVID LOVE, RAZAN ABOLJADAYEL, R. WEATHERUP, P. MONTEIRO,, ADRIAN IONESCU, C. H. W BARNES, Cavendish Laboratory, Dept. of Physics, University of Cambridge — Graphene has one of the highest electron mobilities at room temperature, making it ideal for next generation electronic devices. However, due to its small spin-orbit coupling it is not possible to manipulate spins directly in a pristine graphene monolayer. This may be overcome by proximity to a ferromagnet. Recent theoretical and experimental publications [1] indicate that on a Ni surface the graphene band structure is spin split. The authors used XMCD to measure the magnetic moment induced on the π- electrons in graphene due to the proximity effect with Ni, obtaining a value between 0.05-0.10 μ_B per C atom. We have produced a uniform graphene layer grown by a CVD process directly a Ni coated substrate (the catalyst). By varying key growth parameters (temperature pressure) the interaction between graphene and the catalyst can be tuned to provide strong epitaxial alignment between graphene and Ni or a more weakly oriented rotated alignment. We will present results showing a magnetic enhancement at the ferromagnet - C interface extracted from recent polarized neutron reflectivity measurement on both epitaxial and rotated graphene wrapped ferromagnetic surfaces. [1] V. Karpan, et al., Phys. Rev. B 78, 195419 (2008), M. Weser,et al., Appl. Phys. Lett. 96, 012504 (2010)

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