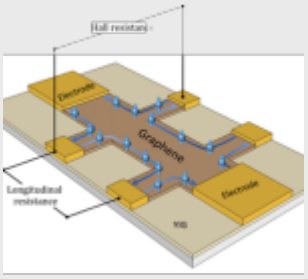
Spin Pumping And Quantum Anomalous Hall Effect In 2D-based Materials



Title: Spin Pumping And Quantum Anomalous Hall Effect In 2D-based Materials
When: Monday, 25 April (2016), 12:00h
Place: Departamento de Física Teórica de la Materia Condensada, Facultad Ciencias, Module 5, Seminar Room (5th Floor).
Speaker: Mario Amado, Department of Materials Science and Metallurgy, University of Cambridge, UK.

The recent discovery of the quantum anomalous Hall effect (QAHE) in magnetically doped topological insulators cooled below the millikelvin regime represents a breakthrough in the field of spintronics(1). Theoretically, the QAHE should occur in graphene proximity-coupled to a ferromagnetic insulator(2) but with the promise of much higher operating temperatures for practical applications. Hints of proximity-induced magnetism in graphene coupled to yttrium iron garnet (YIG) films have been reported(3), although the QAHE remains unobserved; the lack of a fully developed plateau in graphene/YIG devices can be attributed to poor interfacial coupling and therefore a dramatically reduced magnetic proximity effect.
Here we report the deposition and characterisation of epitaxial thin-films of YIG on lattice-matched gadolinium gallium garnet substrates by pulsed laser deposition. Pristine exfoliated graphene flakes transferred mechanically onto the YIG are reported alongside results that correlate the effects of YIG morphology on the electronic and crystal properties of graphene by electrical (low temperature magnetoresistance measurements in Hall-bar-like configuration) and optical (Raman) means.
References

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