Abstract Submitted
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Doping Dependent Magnetic Structure of Graphene Nanostructures[1] SOMNATH BHOWMICK, Indian Institute of Science, UMESH WAGHMARE, JNCASR, Bangalore, R. SHANKAR, MatScience, Chennai, VIJAY SHENOY, Indian Institute of Science — Graphene nanostructures bounded by zigzag edges are predicted to have interesting magnetic structure. We investigate how doping of the nanostructures by holes affects their magnetism. By a detailed mean-field analysis of the Hubbard model, and supported by first principles calculations, we show that doping dramatically changes the magnetic structure. In the case of a zigzag terminated nanoribbon, there is a range of doping that depends on the width of the nanoribbon, where magnetizations of both the zigzag edges are parallel ("ferro" structure) as opposed to the undoped case where the magnetization on the two zigzag edges are anti-parallel ("anti-ferro"). We explain these results by means of a continuum field theory. We also study doping dependence of magnetic structure of other zigzag terminated nanostructures such as nanodots and find this to be a generic phenomenon in these systems.

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Vijay Shenoy
Indian Institute of Science

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