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Electronic properties of Graphene quantum dots PAWEL HAWRYLAK, Institute for Microstructural Sciences NRC, Ottawa, PAWEL POTASZ, Wroclaw University of Technology, Poland, A. DEVRIM GÜÇLÜ, Institute for Microstructural Sciences NRC, Ottawa — We study electronic properties of Graphene quantum dots in magnetic fields. Graphene quantum dots are atomically thick nanometer-scale islands constructed by connecting benzene molecules. Quantum dots with triangular and hexagonal shape have shown to have different edge properties [1,2], and triangular zig-zag structures have recently attracted attention due to their half-filled zero-energy edge states. In this work, we investigate electronic and magnetic properties of triangular and hexagonal shaped islands. We study the effect of first and second nearest neighbour interactions, magnetic field and the number of atoms on the single-particle properties using a tight-binding model. We then use configuration interaction method to study the effect of electron-electron interactions on the ground state properties including magnetization, excitation spectra, and their effect on Coulomb blockade and tunneling through graphene islands. [1] J. Fernandez-Rossier and J.J. Palacios, Phys.Rev.Lett. **99**, 177204 (2007), [2] M. Ezawa, Phys.Rev.B, **77**, 155411 (2008).

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