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Electronic Properties of Curved Graphene-Ring Structures[1] DAIARA FARIA, ANDREA LATGE, Universidade Federal Fluminense, SERGIO ULLOA, NANCY SANDLER, Ohio University — We have undertaken a theoretical investigation of electronic properties of a curved graphene ring in the Dirac approximation making use of elasticity theory. This study is motivated by experimental reports that indicate the existence of gauge-fields in graphene when it is under tension and also by the recent possibility of controlling deformations in its surface in a variety of shapes on different substrates [1]. We discuss how an Aharonov-Bohm field can be used to design new responses obtained by adding real magnetic fluxes and pseudomagnetic fields. We show that the persistent current tends to be inhomogeneous in the same way that the Fermi velocity has a spatial-dependent character[2]. We also discuss the role of strain in the position of the Dirac points that have been the source of recent controversies. [1] T. Georgiou et al., Appl. Phys. Lett. 99, 093103 (2011). [2] F. de Juan et al., PRL 108, 227205 (2012). [3] A. Kitt et al., Phys. Rev. B 85, 115432 (2012)

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