Abstract Submitted
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Theoretical STM maps of curved graphene[1] G.S. DINIZ, Department of Physics and Astronomy, Ohio University, Athens-OH, S.E. ULLOA, Department of Physics & Astronomy, Ohio University — We calculate the effect of curvature on the electronic states in monolayer graphene, considering a local ripple along different directions on the plane. The curvature introduces hybridization between σ and π bands and affects the electronic structure and associated wave functions, even opening a gap of the order of few meV at the Dirac point. Our calculation uses a non-orthogonal four-orbital tight-binding representation up to nearest-neighbors, which fully describes the electronic states of the structure. We focus this study on the analysis of theoretical STM maps for different ripple directions and radius of curvature. We discuss the appearance of a well defined pattern in the STM map near the Dirac point, which is strongly modified when the graphene is rippled along different directions, and discuss this effect in terms of a geometric Berry phase. Although it is difficult experimentally to produce and control a well defined direction for the graphene ripple, recent experiments suggest that this structure may be possible in suspended samples with stressors along the edges [1].

[1] W. Bao *et al.*, Nature Nanotech. **4**, 562 (2009).

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