Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

HgTe/CdTe heterostructure under perturbations preserving time reversal symmetry: a density functional theory study PAULO PIQUINI, JONAS ANVERSA, Universidade Federal de Santa Maria, TOME SCHMIDT, Universidade Federal de Uberlândia, ADALBERTO FAZZIO, Universidade de São Paulo — The Dirac-like spin states at the interfaces of HgTe/CdTe heterostructures are predicted to be robust against perturbations preserving time-reversal symmetry. However, these perturbations will certainly affect these interface states. In this work we use the density functional theory to study the behavior of these interface states under external pressure and electric fields. Differently from the three-dimensional topological insulators, the HgTe/CdTe interface states present fully in-plane Rashba-like spin texture. Further, biaxial external pressures and electric fields perpendicular to the interfaces are seen to change the energetics and dispersion of the protected states, modifying the energy ordering of the crossing of the polarized interface states inside the band structure, and altering their Fermi velocities while not changing the topological quantum phase.

Paulo Piquini
Universidade Federal de Santa Maria

Date submitted: 14 Nov 2014 Electronic form version 1.4