

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Ferromagnetism in 3×3 Pb/Ge(111) and Sn/Ge(111) Surface Reconstructions¹ GEOVANI MONTOYA, JOSE RODRIGUEZ, Department of Physics and Astronomy, CSU Los Angeles — We look for magnetic instabilities in 3×3 surface reconstructions of Pb/Ge(111) and of Sn/Ge(111) by studying the one-orbital Hubbard model over a honeycomb-distorted triangular lattice at half filling. Two graphene-like bands exist above and below the Fermi level. A flat band that crosses the Fermi level lies in between them. It results in a large density of states at the Fermi level. We thereby predict a Stoner ferromagnetic instability at weak on-site Coulomb repulsion. It is consistent with the surface ferromagnetism predicted previously at large on-site Coulomb repulsion on the basis of the spin-1/2 Heisenberg model over the honeycomb-distorted triangular lattice[1]. Comparison of the magnetic energy gain with the elastic energy cost at the surface yields a threshold coupling strength for the electron-phonon interaction related to the 3×3 reconstruction. [1] J.P. Rodriguez and E. Artacho, Phys. Rev. B 59, R705 (1999).

¹Work supported in part by NSF PREM grant no. DMR-1523588.

Jose Rodriguez
Department of Physics and Astronomy, CSU Los Angeles

Date submitted: 11 Nov 2016

Electronic form version 1.4