

Abstract Submitted  
for the MAR16 Meeting of  
The American Physical Society

**Tunable Kondo effect and spin textures on topological insulators surfaces**<sup>1</sup> ILYA VEKHTER, Department of Physics and Astronomy, Louisiana State University, GERARDO ORTIZ, Department of Physics and Center for Exploration of Energy and Matter, Indiana University Bloomington, LEONID ISAEV, JILA, NIST and Department of Physics, University of Colorado Boulder — We consider screening of a spin-1/2 impurity at the surface of a topological insulator, and show that the very existence of Kondo screening strongly depend on details of the bulk material and surface preparation whose details are encoded in time-reversal preserving boundary conditions for electronic wavefunctions. We investigate in detail the formation of the Kondo resonance by studying the "orbital-flip" processes that screen the impurity spin in the resulting strongly spin-orbit coupled system. This mechanism gives rise to spin textures that can be used to experimentally probe signatures of a Kondo resonance in topological insulators, and we give examples relevant to specific materials.

<sup>1</sup>L.I. was supported by the NSF (PIF-1211914 and PFC-1125844), AFOSR, AFOSR-MURI, NIST and ARO individual investigator awards, and also in part by ICAM. I.V. acknowledges support from NSF Grant DMR-1105339.

Leonid Isaev  
JILA, NIST and Department of Physics, University of Colorado Boulder

Date submitted: 06 Nov 2015

Electronic form version 1.4