Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Effect of spin-orbit coupling on the topological phase diagram of a Shiba chain[1] JUNHUA ZHANG, College of William and Mary, YOUNGHYUN KIM, University of California - Santa Barbara, ROMAN LUTCHYN, Microsoft Research Station Q, E. ROSSI, College of William and Mary — Recently chains of magnetic adatoms placed on the surface of a superconductor with strong spin-orbit coupling have emerged as very promising systems for the realization of Majorana modes [1]. In a recent work we have found that the presence of spin-orbit coupling can qualitatively modify the spectrum of the impurity-bound states, Yu-Shiba-Rusinov states, induced by a single magnetic impurity placed on a superconductor, when higher angular momentum components of the impurity potential are taken into account [2]. Motivated by these results, we study in detail the effect of spin-orbit coupling on the electronic spectrum of a chain of Yu-Shiba-Rusinov states created by magnetic adatoms placed on the surface of a superconductor. In particular, we study the effect of the spin orbit coupling on the topological phase diagram of a chain of Yu-Shiba-Rusinov states.
[1] S. Nadj-Perge, I. K. Drozdov, J. Li, H. Chen, S. Jeon, J. Seo, A. H. MacDonald, B. A. Bernevig, Ali Yazdani, Science 346, 602 (2014). [2] Younghyun Kim, Junhua Zhang, E. Rossi, and Roman M. Lutchyn, arXiv:1410.4558 (2014).

[1]We acknowledge support from ONR-N00014-13-1-0321.

Junhua Zhang
College of William and Mary

Date submitted: 13 Nov 2014 Electronic form version 1.4