

Abstract Submitted  
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**Influence of Rashba spin-orbit interactions on the Kondo effect<sup>1</sup>**

ARTURO WONG, KEVIN INGERSENT, U. of Florida, MAHDI ZAREA, Northwestern U., SERGIO ULLOA, NANCY SANDLER, Ohio U. — Recent studies [1] have pointed out that the thermodynamics of the Kondo effect are essentially unaltered by the presence of Rashba spin-orbit interactions in a host two-dimensional electron gas. However, it has also been proposed [2] that the presence of bulk Rashba interactions induces a coupling between a magnetic impurity and conduction electrons with nonzero orbital angular momentum about the impurity site. In this work we revisit this problem using the numerical renormalization group. In agreement with previous studies, we find only minor changes in the Kondo temperature scale when the Rashba coupling is increased at fixed Fermi energy. However, for fixed band filling, increasing the spin-orbit coupling can move the Fermi energy near to a Van Hove singularity in the effective density of states, leading to an exponential enhancement of the Kondo scale. Static spin correlations confirm that the impurity couples to conduction channels of nonzero orbital angular momentum. We also explore the effects of a magnetic field applied in the plane of the host system.

[1] J. Malecki, *J. Stat. Phys.* 129, 741 (2007); R. Žitko and J. Bonča, *Phys. Rev. B* 84, 193411 (2011).

[2] M. Zarea, S. Ulloa and N. Sandler, *Phys. Rev. Lett.* 108, 046601 (2012).

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