

MAR15-2014-020181

Abstract for an Invited Paper
for the MAR15 Meeting of
the American Physical Society

Interaction-driven sub-gap resonance in the topological Kondo insulator SmB6¹

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Samarium hexaboride (SmB6) is a strongly correlated Kondo Insulator with a non-trivial band-structure topology. I will discuss recent neutron scattering experiments and analysis that expose a 14 meV resonant mode in SmB6 and relate it to the low energy insulating band structure. Repeating outside the first Brillouin zone, the mode is coherent with a $5d$ -like magnetic form factor. I will discuss how band inversion can be inferred from neutron scattering and show that a perturbative slave boson treatment of a hybridized 2 species (d/f) band structure within an Anderson model can produce a spin exciton with the observed characteristics. This analysis provides a detailed physical picture of how the SmB6 band topology arises from strong electron interactions, and accounts for the 14 meV resonant mode as a magnetically active exciton.

¹The work at IQM was supported by the US Department of Energy, office of Basic Energy Sciences, Division of Material Sciences and Engineering under grant DE-FG02-08ER46544.