Abstract submitted to the
NATO ADVANCED RESEARCH WORKSHOP
New materials for thermoelectric applications: theory and experiment
September 19 - 25, 2011 Hvar, Croatia

Anisotropic Kondo insulators[1]

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Submitted : 12-09-2011
Keywords : Kondo insulator, anisotropy, hybridization nodes

Kondo insulators represent a special class of heavy fermion systems where one half-filled conduction band hybridizes with an almost dispersionless $4f$ level, resulting in a heavy quasiparticle band with a small energy gap of a few meV at the Fermi level [1]. Due to their large ("giant") thermopower, they are interesting candidates for thermoelectric applications [2]. The chances to realize the above described situation experimentally has been considered highest in simple, cubic compounds. Indeed, most Kondo insulators known to data are cubic [1,3]. More recently, non-cubic compounds with anisotropic properties, frequently referred to as Kondo semiconductors or semimetals, have arisen considerable interest. To describe the anisotropic properties of orthorhombic CeNiSn, for instance, it has been suggested that the hybridization vanishes along a symmetry axis of the crystal to produce nodes in the gap [4,5]. Also, more exotic models such as a topological Kondo insulator [6], have recently been discussed. These topics shall be discussed on the basis of experimental results on anisotropic Kondo insulators.

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[1] This work was supported by the ERC Advanced Researcher Grant No. 227378 and the Austrian Science Fund (FWF project P19458).