

Abstract Submitted
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Investigation of the role of spin-orbit coupling on transport properties of iron pnictide materials¹ SUDHAKAR PANDEY, HIROSHI KONTANI, DAI HIRASHIMA, Nagoya University, Japan, RYOTARO ARITA, HIDEO AOKI, University of Tokyo, Japan — A generic feature associated with the electronic structure of iron pnictides and chalcogenides, which are currently under intense investigation for their superconducting properties, is that the 3d orbitals of Fe make dominant contribution to density of states near the Fermi level. Incorporating this along with other realistic band features within a multiband tight-binding model, we investigate the role of atomic spin-orbit coupling associated with the 3d orbitals on the transport properties of these materials. Our investigation highlights the importance of some characteristic features associated with the electronic band, such as accidental degeneracy, Dirac cone, and orbital hybridization. we find significantly large spin Hall conductivity in the paramagnetic state that is comparable with Pt. We also find finite anomalous Hall conductivity in the ferromagnetic state.

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