Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Strongly spin-orbit coupled spin-3/2 model for $5d^1$ AB_2O_4 spinels[1]
YI-PING HUANG, GANG CHEN, MICHAEL HERMELE, University of Colorado Boulder — Research on 5d transition metal oxides has been more and more active recently. Unlike in 3d transition metals, the strong spin orbit interaction cannot be treated as a perturbation. The competition between correlation, spin orbit coupling and the kinetic energy of 5d electrons makes the problem nontrivial. We model the AB_2O_4 spinel structure with single d electron on atom B as a Hubbard type model. By treating the hopping term perturbatively under large spin orbit coupling we derive an effective spin 3/2 model which is not Heisenberg-like. We further investigate the possible phase diagram of the effective spin 3/2 model.

[1]This work is supported by DOE award no. DE-SC0003910.

Yi-Ping Huang
University of Colorado Boulder

Date submitted: 09 Nov 2012 Electronic form version 1.4