Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

**SmO thin films: a flexible route to correlated flat bands with nontrivial topology**[1] DEEPA KASINATHAN, Max Planck Institute for Chemical Physics of Solids, Dresden, KLAUS KOEPERNIK, IFW Dresden, P.O. Box 270116, D-01171 Dresden, LIU HAO TJENG, MAURITS HAVERKORT, Max Planck Institute for Chemical Physics of Solids, Dresden — Using density functional theory based calculations, we show that the correlated mixed-valent compound SmO is a 3D strongly topological semi-metal as a result of a $4f$-$5d$ band inversion at the X point. We also show that the topological non-triviality in SmO is very robust and prevails for a wide range of lattice parameters, making it an ideal candidate to investigate topological nontrivial correlated flat bands in thin-film form. Moreover, the electron filling is tunable by strain. In addition, we find conditions for which the inversion is of the $4f$-$6s$ type, making SmO to be a rather unique system. The similarities of the crystal symmetry and the lattice constant of SmO to the well studied ferromagnetic semiconductor EuO, makes SmO/EuO thin film interfaces an excellent contender towards realizing the quantum anomalous Hall effect in a strongly correlated electron system.

[1]Funding by the DFG within FOR 1346 is acknowledged

Deepa Kasinathan
Max Planck Institute for Chemical Physics of Solids, Dresden

Date submitted: 11 Nov 2014 Electronic form version 1.4