

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Topological magnon bands in pyrochlore iridate thin films PONTUS LAURELL, GREGORY A FIETE, University of Texas at Austin — Thin films of pyrochlore iridates ($A_2Ir_2O_7$) have previously been studied using weak-coupling techniques such as DFT and DMFT. Here we approach the systems from the strong coupling limit. Since the pyrochlore iridates most likely reside in the difficult to access intermediate coupling regime, a strong coupling study should offer a complementary viewpoint to existing studies. We carry out a variational mean field calculation of the magnetic ground state configurations. We show that the all-in/all-out state, known as the bulk ground state, is generically present in the triangular-Kagome-triangular trilayers. This state can also be found in bilayer films, in specific parameter regimes. A linear spin-wave analysis of the magnetic excitations is also carried out. It shows that when the magnetic order is in (or close to) the all-in/all-out state, the lowest magnon band acquires a non-zero Chern number, leading to the prediction that pyrochlore iridate thin films can host the magnon Hall effect.

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Date submitted: 06 Nov 2015

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