Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Monte Carlo simulations of the fcc Kagomé lattice[1] VAHID HEMMATI, MARTIN PLUMER, JOHN WHITEHEAD, Memorial University of Newfoundland, BYRON SOUTHERN, University of Manitoba — For many years, Ir-Mn alloys have been widely used by the magnetic storage industry in thin-film form as the antiferromagnetic pinning layer in GMR and TMR spin valves [1]. Despite the technological importance of this structure, it has not previously been noted that the magnetic Mn-ions of fcc $IrMn_3$ reside on Kagomé layers ABC stacked along <111> axes normal to the film plane [2,3]. Results of Monte Carlo simulations will be reported on the bulk fcc Kagomé lattice for both XY and Heisenberg models including the eight NN exchange interactions. Degeneracies persist in the 3D case and there is strong evidence for a fluctuation-driven first-order transition to well-defined long-range order characterized as the layered "q=0" 120-degree spin structure. Effects of varying the inter-layer coupling are also examined.

[1] M. Tsunoda et al, Appl. Phys. Lett. **97**, 072501 (2010).
[2] I. Tomeno et al, J. Appl. Phys. **86**, 3853 (1999).
[3] L. Szunyogh et al, Phys. Rev. B **79**, 020403(R) (2009).

[1]Supported by NSERC and ACEnet.

Martin Plumer
Memorial University of Newfoundland

Date submitted: 01 Nov 2011 Electronic form version 1.4