Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Magnetic order in the frustrated Ising-like chain compound Sr_3NiIrO_6 E. LEFRANÇOIS, Institut Laue-Langevin - Institut Néel, L.C. CHAPON, Institut Laue-Langevin, V. SIMONET, P. LEJAY, R. BALLOU, Institut Néel, S. RAYAPROL, UGC-DAE CSR, Mumbai Center, E.V. SAMPATHKUMARAN, Tata Institute of Fundamental Research, D. KHALYAVIN, ISIS Facility, STFC, Rutherford Appleton Laboratory, D.T. ADROJA, ISIS Facility, STFC, Rutherford Appleton Laboratory - University of Johannesburg — Oxides of the family $A_3MM'O_6$ (A = alkaline-earth metal, M, M'= transition metal) attracted a lot of attention because of their unconventional magnetic properties due to the interplay between low dimensionality, magnetic frustration and magnetocrystalline anisotropy. In these compounds, the M and M' ions form chains which are distributed on a triangular lattice. We studied the 5d-based system Sr_3NiIrO_6, which is in the strong spin-orbit coupling regime, by single crystal magnetization measurements and neutron powder diffraction. The magnetization revealed a large easy-axis of anisotropy confining the Ni^{2+} and Ir^{4+} magnetic moments along the chains. Besides, the zero-field-cooled and field-cooled measurements show that there are two characteristic temperatures: $T_1 = 75$ K and $T_2 = 17$ K. The first one is associated with the appearance of a magnetic order with a propagation vector k = (0, 0, 1). At T_2, the susceptibility reaches a maximum followed by a sudden drop. The magnetic structure was determined from neutron powder diffraction only up to a global phase. However, symmetry arguments allowed determining the exact nature of the magnetic ground state below T_2, thus clarifying the universal magnetic properties of this family of compounds.

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Date submitted: 14 Nov 2014 Electronic form version 1.4