Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

The interplay of ferromagnetic and antiferromagnetic exchanges in the the 3d-5d transition metal oxides Sr2BIrO6 (B=Ni, Cu, Zn) KATHARINA ROLFS, EKATERINA POMJAKUSHINA, SANDOR TOTH, VLADIMIR POMJAKUSHIN, KAZIMIERZ CONDER, Paul Scherrer Institute — In the field of strongly correlated electron systems significant attention has been drawn towards the study of compounds based on magnetic 4d and 5d transition metal (TM) oxides. The spin orbit coupling (SOC) within these systems becomes non-negligible compared to the crystal field energies and leads to new exotic ground states, such as the Mott insulating state in Sr2IrO4. In order to understand the influence of the SOC on the electronic ground state the focus also turned to mixed 3d-5d systems, which gives the possibility to disentangle SOC effects from common charge-spin-orbital physics, as it is present in pure 3d TMOs and could also introduce new properties. One group within these candidates is the group of Ir-based double perovskites A2BIrO6 (B=3d TM). While in a large number of insulating 3d TMOs, the superexchange interactions between magnetic ions being nearest neighbour is adequate to determine the magnetic order, the SOC of 5d elements can change the exchange topology. This is possibly the case for Sr2NiIrO6, Sr2CuIrO6 and Sr2ZnIrO6. All compounds are high oxygen pressure compounds, which we successfully synthesised. The influence of the 3d metal on the magnetic properties will be discussed based on bulk magnetisation, transport measurements and neutron diffraction.

Katharina Rolfs
Paul Scherrer Institute

Date submitted: 07 Nov 2015 Electronic form version 1.4