Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

**Colossal Triplet Spin-Valve Effect in Heterostructures containing 100% Spin Polarised Fe0.8Co0.2Si**[1] GAVIN BURNELL, NATHAN SATCHELL, BENJAMIN STEELE, PRIYASMITA SINHA, CHRISTOPHER MARROWS, School of Physics and Astronomy, University of Leeds, SEAN LANGRIDGE, ISIS Neutron and Muon Source, STFC Rutherford Appleton Laboratory, UK EPSRC SUPERCONDUCTING FERROMAGNETIC METAMATERIAL CONSORTIUM COLLABORATION — At the interface between a superconductor (S) and ferromagnet (F), an inhomogeneity can convert singlet Cooper pairs into the (spin aligned) long ranged triplet component (LRTC). Manipulation of the LRTC forms the basis of the emerging field of super-spintronics. The prototypical device in this field is the superconducting spin valve (SSV), where LRTC generation can be controlled by the relative orientation of two F layers in a heterostructure. This generation is accompanied by an observed suppression in the superconductors critical temperature ($T_c$). Motivated by a recent report of colossal proximity effects in a $F_1/F_2/S$ SSV containing 100% spin polarized $CrO_2$ as the bottom drainage layer[2], we explore the possibility of using highly spin polarized, $Fe_{0.8}Co_{0.2}Si$ as $F_1$. The observed $T_c$ suppression of 830 mK is nearly an order of magnitude larger than previous studies using standard F layers with Nb, and is consistent with that seen in $CrO_2$. Our results confirm the special importance of high spin polarization in the formation of the LRTC, and we offer the field a new material as a fundamental building block for incorporation into future super-spintronic devices.

[1]UK EPSRC Grants EP/J010634/1, EP/I000933/1
[2]A. Singh, *et al.*, **Phy. Rev. X** 5, 021019

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Date submitted: 09 Nov 2015 Electronic form version 1.4