Abstract Submitted
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A Compton scattering study of the magnetic structure of $NbFe_2$ THOMAS HAYNES, University of Bristol, UK, MATTHEW BUTCHERS, JONATHAN DUFFY, University of Warwick, UK, STEPHEN DUGDALE, University of Bristol, JONATHAN TAYLOR, SEAN GIBLIN, ISIS Facility, RAL, UK, JUDE LAVEROCK, Boston University, CLAUDIA UTFELD, University of Bristol, ROSS STEWART, ISIS Facility, RAL, UK — $NbFe_2$ displays a diverse phase diagram over a narrow compositional range, possibly due to close proximity to a Quantum Critical Point. The ground state of $NbFe_2$ has been the subject of a number of recent theoretical investigations [1,2], but for near-stoichiometric compositions its exact nature remains ambiguous. We have probed the low temperature magnetic structure by performing Magnetic Compton Scattering (MCS) measurements on polycrystalline $Nb_{1+y}Fe_{2-y}$ samples with $y = -0.02, 0.00$ and 0.03. MCS is able to measure how the magnetic electrons within a sample are distributed in momentum space, and can be a useful tool for resolving site-specific contributions to the spin moment. The interpretation of these measurements was aided by electronic structure calculations, which favour a ferrimagnetic ground state. The results are presented with reference to the possible presence of spin fluctuations.

[1] Subedi and Singh, PRB **81**, 024422 (2010)
[2] Tompsett et al, PRB **82**, 155137 (2010)

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