

Abstract Submitted
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Recent neutron scattering results from Gd-based pyrochlore oxides JASON GARDNER, Indiana University — In my presentation I will present recent results that have determined the spin-spin correlations in the geometrically frustrated magnets $\text{Gd}_2\text{Sn}_2\text{O}_7$ and $\text{Gd}_2\text{Ti}_2\text{O}_7$. This will include polarised neutron diffraction, inelastic neutron scattering and neutron spin echo data. One sample of particular interest is $\text{Gd}_2\text{Sn}_2\text{O}_7$ which is believed to be a good approximation to a Heisenberg antiferromagnet on a pyrochlore lattice with exchange and dipole-dipole interactions. Theoretically such a system is expected to enter long range ordered ground state known as the “Palmer Chalker” state [1]. We show conclusively, through neutron scattering data, that the system indeed enters an ordered state with the Palmer-Chalker spin configuration below $T_c = 1$ K [2-3]. Within this state we have also observed long range collective spin dynamics, spin waves. This work has been performed in collaboration with many research groups including G. Ehlers (SNS), R. Stewart (ISIS).

[1] S. E. Palmer and J. T. Chalker, Phys. Rev. B 62, 488 (2000).

[2] J. R. Stewart, G. Ehlers, A. S. Wills, S. T. Bramwell, and J. S. Gardner, J. Phys.: Condens. Matter 16, L321 (2004).

[3] J R Stewart, J S Gardner, Y. Qiu and G Ehlers, Phys. Rev. B. 78, 132410 (2008)

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