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Evidence for a strong coupling transition in $Y_2Ru_2O_7$ JOOST VAN DUIJN, Johns Hopkins University / ISIS , NAMJUNG HUR, Rutgers University, JON TAYLOR, ISIS Facility, SIMON LEVETT, ISIS Facility, QING HUANG, NIST Centre for Neutron Research, SANG-WOOK CHEONG, Rutgers University, COLLIN BROHOLM, Johns Hopkins University, TOBY PERRING, ISIS Facility
— $Y_2Ru_2O_7$ adopts the pyrochlore structure with Ru occupying the octahedral sites. Magnetization and specific heat measurements indicate that there is a magnetic phase transition at T= 78 K. Diffraction experiments have shown that the Ru-sublattice orders in a long range ordered q=0 structure where the total spin vanishes on each tetrahedron. We have performedneutron inelastic scattering experiments in order to investigate this magnetic phase transition. These experiments show what I would call a strong coupling transition within this material. There are rearrangements in the excitation spectrum at T= 78 K to energies that correspond to room temperature without an apparent change in the wave vector dependence. Light scattering experiments indicate that magneto-elastic effects are important in allowing this phase transition to proceed. From previous work on spinels it has been suggested that this type of transition should be considered the 3 D analogue of a spin-peierls transition in a cooperative spin system [1]. This research was funded by the U.S. Department of Energy, under Grant No. DE-FG02-02ER45983, and by the National Science Foundation, under Grant No. NSF-DMR-0103858. [1]S.-H. Lee et al., Phys. Rev. Lett. 84, 3718 (2000).

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