

Abstract Submitted
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Competing phases in a frustrated magnet: a study with neutron scattering.¹ DAVID HSIEH, Princeton University, YINWAN LI, ZHIMING TAN, ROBERT CAVA, ZAHID HASAN, Princeton University, YIMING QIU, JAE-HO CHUNG, JEFFREY LYNN, NIST — Zero-field magnetic neutron diffraction on the pyrochlore magnet ZnCr_2S_4 reveals successive phase transitions from a paramagnet into a helical ($T_{N1} = 13$ K) then collinear ($T_{N2} = 8$ K) spin ordered state as the system is cooled. This occurs as the system crosses a critical line in J_1 - J_2 space, where J_1 and J_2 are the first and second nearest neighbor exchange constants respectively. We report the magnetic field dependence of the dc susceptibility and neutron scattering of ZnCr_2S_4 in the form of a temperature-field phase diagram. We also study the low energy excitation spectrum of ZnCr_2S_4 which was found to be consistent with the J_1 - J_2 model.

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