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Temperature and magnetic field dependent Raman scattering study of magnetically frustrated Mn_3O_4[1] T. BYRUM, S.L. GLEASON, Y. GIM, A. THALER, P. ABBAMONTE, G.J. MACDOUGALL, S.L. COOPER, Department of Physics and Frederick Seitz Materials Research Laboratory, University of Illinois, Urbana, Illinois 61801, USA — The coupling between spin and lattice degrees of freedom is presumed to be responsible for many of the novel phenomena observed in the magnetically frustrated spinel Mn_3O_4. While the lattice excitations have previously been investigated by Kim *et al.*,* the dependences of the spin excitations in Mn_3O_4 with magnetic field and temperature have not yet been reported. We perform inelastic light (Raman) scattering to study the spin excitations in Mn_3O_4 as functions of temperature and magnetic field. We observe both one- and two-magnon excitations below the magnetic transition temperature of Mn_3O_4. In this presentation, we will discuss the temperature and magnetic field dependent evolutions of these excitations. Interestingly, we conclude that some of the magnon excitations are likely associated with the frustrated B-site sublattice of the spinel (AB_2O_4) structure. These results set the stage for future studies of the coupling between spin and lattice degrees of freedom in Mn_3O_4 as functions of pressure, temperature, and magnetic field. *M. Kim, X. M. Chen, X.Wang, C. S. Nelson, R. Budakian, P. Abbamonte, and S. L. Cooper, Phys. Rev. B 84, 74424 (2011).

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