Abstract Submitted
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Possible Structural Distortions in $NiGa_2$ S_4 indicated by T-dependent Raman Modes[1] MICHAEL VALENTINE, Department of Physics and Astronomy, Johns Hopkins University, Baltimore, Maryland, USA, SATORU NAKATSUJI, TOMOYA HIGO, Institute for Solid State Physics, University of Tokyo, Kashiwa, Chiba, Japan, COLLIN BROHOLM, NATALIA DRICHKO, Department of Physics and Astronomy, Johns Hopkins University, Baltimore, Maryland, USA — $NiGa_2S_4$ contains two dimensional sheets of spin-1 Ni^{2+} ions arranged in a triangular lattice where ferromagnetic nearest neighbor interactions and antiferromagnetic third nearest neighbor interactions lead to magnetic frustration which suppresses three dimensional magnetic ordering above 1.5K [1]. We studied structural distortions in $NiGa_2S_4$ by Raman spectroscopy on single crystals in the energy range of 150 cm^{-1} to 500 cm^1. For temperatures below 300K the 446 cm^{-1} A_{1g} mode splits and additional E_g modes are observed between 250 cm^{-1} and 450 cm^{-1}. These high energy features are associated with sulfur vibrations but are not predicted to occur on the basis of the point group symmetry inferred from x-ray diffraction. We discuss possible lattice distortions due to magneto-elastic coupling and their potential effects on low temperature frustrated magnetism.

[1] C. Stock et al., Phys. Rev. Lett. 105, 037402 (2010)

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