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Incommensurate spin correlations in a spin-1 triangular lattice antiferromagnet SETH JONAS, CHRIS STOCK, COLLIN BROHOLM, Department of Physics and Astronomy, Johns Hopkins University, Baltimore, MD 21218, USA, SATORU NAKATSUJI, YUSUKE NAMBU, HIROSHI TONOMURA, OSAMU SAKAI, YOSHITERU MAENO, Department of Physics, Kyoto University, Kyoto 606-8502, Japan — Spin correlations in the triangular lattice antiferromagnet NiGa2S4 were investigated as a function of temperature and magnetic field through neutron scattering. At T=1.5 K the in plane correlations are incommensurate with a wave vector $(\frac{1}{6}-\delta, \frac{1}{6}-\delta, 0)$ where $\delta = 0.00866$. The in-plane correlation length is 6.9(8) lattice spacings while inter-plane correlations cannot be detected beyond the second nearest plane. These correlations persist on a time scale that exceeds 0.3 ns. Application of an in-plane magnetic field of 10 Tesla only slightly reduces the inter-plane correlations with no appreciable effect on intra-plane correlations, while heating reduces the frozen moment, the in-plane correlation length, and the correlation time. We shall discuss what can be inferred about the spin Hamiltonian for NiGa2S4 as well as the spin-1 triangular lattice antiferromagnet from these data.

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