

Abstract Submitted  
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**Competing interactions and continuum excitations in the spin-1 triangular lattice antiferromagnet NiGa<sub>2</sub>S<sub>4</sub>**<sup>1</sup> J. WEN, IQM, Johns Hopkins Univ, USA, Y. NAMBU, ISSP, Univ. of Tokyo, Japan, J. RODRIGUEZ, C. STOCK, NCNR, NIST, USA, S. NAKATSUJI, ISSP, Univ. of Tokyo, Japan, S. ONODA, RIKEN, Japan, Y. MAENO, Kyoto Univ., Japan, C. BROHOLM, IQM, Johns Hopkins Univ, USA — In some geometrically frustrated magnets, conventional long range order is replaced by static or dynamic short range order. Quasi-2D NiGa<sub>2</sub>S<sub>4</sub> is the only known S=1 antiferromagnet with an exact triangular lattice. Recent neutron scattering experiment on high quality NiGa<sub>2</sub>S<sub>4</sub> single crystals revealed short range quasi-2D incommensurate spin correlation with a critical wavevector close to (1/6, 1/6, 0) [1]. Here we report a measurement of the dynamic spin correlation function through a volume of **Q**-E space for T≪J. A gapless spectrum was observed at the incommensurate critical wavevector while a softened but still gapped response was found at (1/3, 1/3, 0). This indicates dominant third nearest neighbor interaction and competing weaker near neighbor interactions. The excitation spectrum takes the form of a bounded continuum throughout the 2D Brillouin zone. The temperature dependence dynamic correlation length shows that short range correlation persist up to  $\Theta_{cw} = -80(2)$ K.

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

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