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Bilinear-Biquadratic Spin 1 Heisenberg Zig-Zag Chain PHILIPPE CORBOZ, Institut fuer theoretische Physik, ETH Zurich, CH-8093 Zurich, Switzerland, ANDREAS LAEUCHLI, Institut Romand de Recherche Numerique en Physique des Materiaux (IRRMA), CH-1015 Lausanne, Switzerland, HIROKAZU TSUNETSUGU, Institute for Solid State Physics, University of Tokyo, Kashiwa, Chiba 277-8581, Japan — Recent theoretical studies raised the possibility of a realization of spin nematic states in the S=1 triangular lattice compound NiGa2S4. We study the bilinear-biquadratic spin 1 Heisenberg chain in a zig-zag geometry by means of Density Matrix Renormalization Group (DMRG) and Exact Diagonalization (ED). We present the phase diagram focusing on antiferromagnetic interactions. Adjacent to the known Haldane / double Haldane and the extended critical phase with dominant spin nematic correlations we find a trimerized phase with a non-vanishing energy gap. We discuss results for different order parameters, energy gaps, correlation functions and the central charge, and make connection to field theoretical predictions for the phase diagram.

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