

Abstract Submitted
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Quadrupolar phases of the $S=1$ bilinear-biquadratic Heisenberg model on the triangular lattice ANDREAS LÄUCHLI, IRRMA - EPF Lausanne, Switzerland, FRÉDÉRIC MILA, ITP - EPF Lausanne, Switzerland, KARLO PENC, Research Institute for Theoretical Solid State Physics and Optics, Budapest, Hungary — Using mean-field theory, exact diagonalizations and $SU(3)$ flavour theory, we have precisely mapped out the phase diagram of the $S = 1$ bilinear-biquadratic Heisenberg model on the triangular lattice in a magnetic field, with emphasis on the quadrupolar phases and their excitations. In particular, we show that ferroquadrupolar order can coexist with short-range helical magnetic order, and that the antiferroquadrupolar phase is characterized by a remarkable $2/3$ magnetization plateau, in which one site per triangle retains quadrupolar order while the other two are polarized along the field. Implications for actual $S = 1$ magnets, such as NiGa_2S_4 , are discussed.

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