Phase diagram and high degeneracy points for generic anisotropic exchange on the garnet lattice[1] ALEXEI ANDREANOV, PCS, Institute for Basic Science, Daejeon, South Korea, PAUL MCCLARTY, ISIS Neutron and Muon Source, Rutherford-Appleton Laboratory, Harwell Campus, Oxfordshire, OX11 0QX, UK — Garnet magnets with chemical formula $RE_3Ga_5O_{12}$ where RE is a rare earth ion have properties that are determined by a combination of geometrical frustration and strong spin-orbit coupling. The former arises from the RE structure which consists of two interpenetrating hyperkagome lattices while the latter leads, in general, to an anisotropy in the magnetic exchange. We systematically explore and describe the full phase diagram for the case of all nearest-neighbor interactions compatible with lattice symmetries and consider the role of fluctuations and further neighbor couplings around high degeneracy points in the phase diagram.

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