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Weak Chiral Magnetic Order in the Quantum Pyrochlore Antiferromagnet VALERI KOTOV, ITP, Swiss Federal Institute of Technology Lausanne, MAGED ELHAJAL, Max Planck Institute, Halle, MICHAEL ZHITOMIRSKY, CEA, Grenoble, FREDERIC MILA, ITP, Swiss Federal Institute of Technology Lausanne — Heisenberg (S=1/2) spins on the three-dimensional pyrochlore lattice do not order magnetically due to the strong frustration. However we show that the presence of antisymmetric, Dzyaloshinsky-Moriya (DM) interactions, can lead to weak antiferromagnetic order. This exotic state has chiral symmetry, dictated by the distribution of the DM vectors and is characterized by small magnetic moments induced by the DM interactions. An external magnetic field can also produce complex ordered states, and a quantum transition separates the field-induced and chiral ordered phases.

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