Dirac magnons in collinear antiferromagnets KANGKANG LI, Institute of Physics, Chinese Academy of Sciences, CHENYUAN LI, YUAN LI, Peking University, CHEN FANG, Institute of Physics, Chinese Academy of Sciences — We study the topological properties of magnon excitations in a large class of Heisenberg spin systems in three dimensions, where the ground state configuration is collinear and invariant under magnetic group symmetry $P * T$, a composite symmetry of time-reversal followed by space inversion. We prove that in these systems, "Dirac points" are symmetry-protected at band crossing between optical magnon bands, and the corresponding topological surface states have equal energy contours in the shape of non-contractible arcs, unseen in known topological materials. As a concrete example, we study a J_1-J_2 model for spin-web compound, and show the presence of the Dirac magnons using spin wave approximation.

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