Title: Coexisting triple-point and nodal-line topological magnons and thermal Hall effect in pyrochlore iridates

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Abstract:
We present rich and unique topological magnon excitations theoretically found in pyrochlore iridates with all-in-all-out (AIAO) antiferromagnetic order. We find that the spectrum of magnon excitations in the AIAO state supports two kinds of symmetry-protected band crossings. One is triple-point, triply degenerate band crossing protected by magnetic point group symmetry. The other type is nodal-line, doubly generate band crossings occurring along a closed line preserved by non-symmorphic symmetry. By tuning the strength of Dzyaloshinskii-Moriya (DM) interaction, we find three distinct regimes of magnon band topology, characterized by the triple-point distribution in momentum space, with qualitatively different magnon thermal Hall effect. We show that such distinct thermal Hall response is a signature of the topological magnons of the triple-points and nodal-lines. We propose the thermal Hall response can be used to probe the magnon band topology and estimate the size of the DM interaction in pyrochlore iridates.