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【136】Spin-polarized electron-hole pair excitations in Co3Sn2S2 studied by magnetic circular dichroism resonant inelastic X-ray scattering

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$Co_3Sn_2S_2$ is a Weyl ferromagnet (T_c ~ 177 K) with kagome layers stacked along its c-axis. A recent resonant inelastic X-ray scattering (RIXS) study with linear polarized X-rays reported correlation driven near-flat band Stoner excitations. However, our RIXS measurements employing a magnetic circular dichroism (MCD) analysis suggests that the reported "near-flat band"is dispersive and its intensity reduces upon approaching Tc. We suggest these excitations correspond to the electron-hole pair excitations between spin-polarized occupied and unoccupied bands that are s directly related to the magnetic order. Furthermore, the MCD RIXS spectrum shows opposite sign compared to spin waves in the ferromagnetic topological metal Fe3Sn2 due to the orbital moment involvement.

Theoretical Work

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