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Many-Body Interactions in Room-Temperature Van der Waals Magnet Fe5GeTe2

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The complex ground states of recently discovered two-dimensional (2D) magnets with Curie temperatures near room temperature present exciting opportunities for functional spintronic devices, but remain poorly understood. We investigate the electronic and magnetic excitations in the van der Waals ferromagnet Fe5GeTe2 (Tc=300K) using angle-resolved photoemission spectroscopy (ARPES) and resonant inelastic X-ray scattering (RIXS). ARPES measurements reveal a pronounced kink in the band dispersion below the Curie temperature, indicating strong many-body interactions. Complementary RIXS spectra exhibit multiple energy loss features and point to electron-magnon coupling. These findings highlight the interplay between electronic structure and magnetic excitations in Fe5GeTe2 and its potential in room-temperature 2D spintronic applications.

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