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RIXS study on van der Waals multiferroic $CuCrP_2S_6$,

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Characterized by the layered structures and weak interlayer interactions, van-der-Waals quasi-2D materials mark a significant milestone in the field of spintronics due to their unique electronic and magnetic properties. Incorporating multiferroicity, these materials exhibit highly-manipulative properties, allowing the exploration of new quantum phenomena and the potential for revolutionary advances in low-power, non-volatile devices. $CuCrP_2S_6$, one of the van-der-Waals multiferroic materials, has ignited our curiosity. Here, we use high-resolution resonant inelastic X-ray scattering (RIXS) to probe its electronic excitations across the transition temperature 32K, 145K and 190 K. Photon energy- and polarization-dependent RIXS results of $CuCrP_2S_6$ will be presented and discussed.

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