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Resonant inelastic X-ray scattering study of quasi-zero-dimensional copper metaborate JASON HANCOCK, GUILLAUME CHABOT-COUTURE, MARTIN GREVEN, Stanford University, GUERMAN PETRAKOVSKII, Kirenskii Institute, Siberia, KENJI ISHII, JUN'ICHIRO MIZUKI, Japan Atomic Energy Agency — CuB_2O_4 consists of many CuO_4 plaquettes separated by B ions. We report a study of the electronic excitation spectra of this system in order to explore the relationship between excitation symmetry and the resonant inelastic X-ray scattering (RIXS) technique. We find a small number of well separated features in the experimentally accessible range of 0.5-15 eV energy transfer, and weak dispersion is suggestive of the quasi-zero-dimensional nature of this system. Systematic trends in the data are suggestive of a composite nature to one of the observed features. Using a cluster model, we describe these unexpected trends and clarify how the choice of experimental geometry selectively influences the sensitivity to particular excitation symmetries in the RIXS experimental technique.

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