Contribution ID: **223** Type: **Talk**

【513】Anomalous magnetic excitations in the half-filled Tl-based cuprate

Wednesday 11 September 2024 17:45 (30 minutes)

Manifestations of quantum fluctuations on ground states and their excitations are at the heart of condensed matter physics. Electronic two-dimensional square-lattice systems are in the moderate coupling limit extremely complex. Here, we introduce an ultra-clean half-filled cuprate system with moderate correlation strength. Using high-resolution resonant inelastic x-ray scattering, we probe the magnon excitations and their dispersion. We show that the dispersion is associated with a discontinuous “band” velocity. Within a Heisenberg-Hubbard model, this discontinuity is assigned to the presence of strong quantum fluctuations.

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Session Classification: Electron and photon spectroscopies of quantum materials

Track Classification: Electron and photon spectroscopies of quantum materials