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Unconventional metamagnetism and orbital ordering in transition metal oxides (II) WEI-CHENG LEE, CONGJUN WU, Department of Physics, University of California, San Diego — Unlike charge and spin, the orbital degree of freedom of electrons in transition metal oxides is difficult to detect. We present the theoretical study of a new detection method in metallic orbitally active systems by analyzing the quasiparticle scattering interference (QPI) pattern of the spectroscopic imaging scanning tunneling spectroscopy, which is sensitive to orbital structures and orbital ordering. The QPIs for the d_{xz} and d_{yz}-orbital bands in the t_{2g}-orbital systems show a characteristic stripe-like feature as a consequence of their quasi-one-dimensional nature, which is robust against orbital hybridization. With the occurrence of orbital ordering proposed in $Sr_3Ru_2O_7$ and iron-pnictides, the stripe-like QPI patterns exhibit nematic distortion breaking the C_4-symmetry. 1. W.-C. Lee and C. Wu, Phys. Rev. B 80, 104438 (2009). 2. W.-C. Lee and C. Wu, Phys. Rev. Lett. 103, 176101.

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