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Quasi-particle interference and possible orbital order in FeSe T. HANAGURI, RIKEN CEMS, T. WATASHIGE, Dept. Phys., Kyoto Univ., Y. KOHSAKA, K. IWAYA, Y. FU, RIKEN CEMS, S. KASAHARA, D. WATANABE, Y. MIZUKAMI, T. MIKAMI, Y. KAWAMOTO, S. KURATA, T. SHIBAUCHI, Y. MATSUDA, Dept. Phys., Kyoto Univ., A. BÖHMER, T. WOLF, C. MEINGAST, H. V. LÖHNEYSEN, IFP, Karlsruher Institut für Technologie — Spontaneous formation of unidirectional electronic states or nematicity in iron-based superconductors has attracted much attention but spectroscopic understanding of nematicity is still elusive. Using scanning tunneling microscopy/spectroscopy, we have investigated FeSe which becomes superconducting in an orthorhombic phase. Spectroscopic imaging over wide energy range (±50 meV) revealed clear quasi-particle interference (QPI) patterns. In the Fourier-transformed spectroscopic images, we identified unidirectional electron- and hole-like QPI branches, which disperse in orthogonal directions. We argue this behavior in connection to the orbital ordering in the orthorhombic phase.

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