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Friedel oscillations and quasiparticle interference: Complementary STM and REXS approach PEGOR AYNAJIAN, Binghamton University, ANDRS GYENIS, Princeton University, EDUARDO DA SILVA NETO, University of British Columbia , FEIZHOU HE, RONNY SUTARTO, Canadian Light Source, ENRICO SCHIERLE, EUGEN WESCHKE, BESSY, MARIAM KAVAI, Binghamton University, RYAN BAUMBACH, Florida State University, JOE THOMPSON, ERIC BAUER, LANL, ZACHARY FISK, UC Irvine, ANDREA DAMASCELLI, University of British Columbia, ALI YAZDANI, Princeton University — The origin of a competing charge ordering in the high-temperature superconducting cuprates has recently been subject to intense experimental and theoretical debates. Dalla Torre et al theoretically proposed that Friedel oscillations can reproduce the experimentally observed scattering peak in the resonant elastic x-ray scattering (REXS) of cuprates [NJP, 17 022001 2015]. Using complementary spectroscopic imaging with the scanning tunneling microscope and REXS on the heavy fermion compound $CeMIn_5$ (M=Co, Rh) we observe a scattering peak in REXS, similar, yet broader than that found in cuprates. Through temperature and doping dependent experiments, we demonstrate this enhanced peak to originate from the scattering of hybridized heavy f-electrons. We discuss the origin of this phenomenon and its relation to Friedel oscillations and charge ordering.

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