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Coexistence of Chiral Charge Density Wave and Superconductivity in Cu_xTiSe_2[1] G. KARAPETROV, P. HUSANIKOVA, Drexel University, V. CAMBEL, IEE, Slovak Academy of Sciences, Bratislava, Slovakia, P. SZABO, P. SAMUELY, IEP, Slovak Academy of Sciences and Safarik University, Kosice, Slovakia, J. FEDOR, M. IAVARONE, Temple University, Philadelphia, PA — We investigate bulk superconducting properties and atomic scale scanning tunneling microscopy and spectroscopy in Cu_xTiSe_2. We map the vortex phase diagram and find unusually broad vortex liquid regime for such a low-T_c superconductor. STM measurements reveal coexistence of chiral charge density wave and superconductivity. We find that the amplitude of charge density wave modulation is strongly suppressed with respect to strongly underdoped case ($x < 0.06$) with the chiral domain size remaining the same. Superconductivity exhibits BCS character at variety of dopings with $2\Delta/kT_c \sim 3.6 \div 3.7$ indicating an intermediate coupling strength. Application of the external magnetic field introduces the Abrikosov vortex lattice that is weakly pinned. The size of the vortex core extracted from vortex images corresponds to the one extracted from the upper critical field. Our results suggest that, if charge density wave quantum critical point exist, it should be well above the optimal copper concentration of x=0.08.

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