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Interface enhanced superconductivity in single unit-cell FeSe films on $SrTiO_3$(110) LILI WANG, Tsinghua Univeristy — The advent of enhanced superconductivity in FeSe/STO(001) has instigated great interests in other interfacial systems both experimentally and theoretically. To figure out the key role of substrate, STO(110) substrate is of great interest because it resembles STO(001) in high density subsurface oxygen vacancies but distinguishes itself by anisotropic in-plane lattice constants and dielectric constant. Here, we investigated molecular beam epitaxy growth of 1-UC FeSe films on STO(110) substrates and studied the superconducting properties by combined *in-situ* scanning tunneling spectroscopy (STS) and *ex-situ* transport measurement. By STS we observed a superconducting gap as large as 17 meV. Transport measurements on 1-UC FeSe/STO(110) capped with FeTe layers reveal superconductivity with an onset transition temperature (T_C) of 31.6 K and an upper critical magnetic field of 30.2 T. We also find that T_C can be further increased by an external electric field, but the effect is weaker than that on STO(001) substrate. Our study highlights the important roles of interface related charge transfer and electron-phonon coupling in the high temperature superconductivity of FeSe/STO. References: [1] Q. Y. Wang, *et al.*, Chin. Phys. Lett., **29**, 037402 (2012). [2] J. J. Lee *et al.*, Nature **515**, 245 (2014).

Lili Wang
Tsinghua Univeristy

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