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Observation of Dirac cone band dispersions in FeSe thin films by photoemission spectroscopy. SHIYONG TAN, YUN FANG, DONGHUA XIE, WEI FENG, Institute of Materials, China Academy of Engineering Physics, CHENHAOPING WEN, QI SONG, Fudan university, QIUYUN CHEN, WEN ZHANG, YUN ZHANG, LIUZHU LUO, Institute of Materials, China Academy of Engineering Physics, BINPING XIE, Fudan university, XINCHUN LAI, Institute of Materials, China Academy of Engineering Physics, DONGLAI FENG, Fudan university, FENG GROUP TEAM, LAI GROUP TEAM — The search for novel materials with Dirac cone band dispersion is one of the most challenging and important works for both fundamental physics and technological applications. Here, we studied the electronic structure of FeSe thin films grown on $SrTiO_3$ substrates by angle-resolved photoemission spectroscopy (ARPES). We reveal the existence of Dirac cone band dispersions in FeSe thin films thicker than 1 Unit Cell below the nematic transition temperature, whose apexes are located -10 meV below Fermi energy. The evolution of electronic structures for FeSe thin films as function of temperature, thickness and cobalt doping are systematically studied. The Dirac cones are found to be coexisted with the nematicity in FeSe, disappear when nematicity is suppressed. Our results provide useful guidelines for understanding the novel electronic structure, nematicity and superconductivity in FeSe system..

Shiyong Tan
Institute of Materials, China Academy of Engineering Physics

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