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Electronic Structure and High Temperature Superconductivity of the FeSe /SrTiO₃ Films

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High resolution angle-resolved photoemission measurements have been carried out to study the electronic structure and high temperature superconductivity of the single-layer FeSe films grown on SrTiO₃ substrate [1]. Distinct Fermi surface topology and nearly isotropic superconducting gap without nodes are observed in the system [2]. Phase diagram is established and electronic indication of high temperature superconductivity at ~65K is observed in tuning the carrier concentration of the single-layer FeSe film [3]. With a variation of the charge carriers, an insulator-superconductor transition in the single-layer FeSe/SrTiO₃ is observed. A dichotomy of electronic structure and superconductivity is revealed between the single-layer and double-layer FeSe/SrTiO₃ films. Implications of these results on the superconductivity mechanism of the iron-based superconductors will be discussed.

References:

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