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Interfacial Interplay Between Superconducting FeSe Films and Underlying Substrate ROB MOORE, Stanford Institute for Materials and Energy Sciences, SLAC National Accelerator Laboratory — The recent discovery of superconducting single unit cell iron selenide (FeSe) films on strontium titante (STO) substrates with significantly enhanced transition temperatures (Tc) has created a flurry of activity. Understanding the influence of the underlying substrate is paramount for fundamental understanding of the superconducting phenomena with a potential for breaking current Tc records. We have investigated the influence of different substrates and the interfacial structure utilizing thin films grown via molecular beam epitaxy (MBE) with in situ angle-resolved photoemission spectroscopy (ARPES) and low energy electron diffraction (LEED-IV) characterization. We will discuss the implications of substrates on the electronic and crystalline structure of the single FeSe unit cell. Our results help illuminate the interfacial coupling between these degrees of freedom and suggest mechanisms for Tc enhancement.

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