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Surface metal doping of topological insulator Bi_2Se_3 thin films[1]
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Three-dimensional topological insulators have attracted much attention due to their spin-momentum locked surface Dirac states, which have been proposed as the basis for spintronics and quantum computing. In the case of Bi_2Se_3, thin films grown by molecular beam epitaxy are typically heavily doped n-type, which places the Fermi level outside its band gap, making it challenging to develop devices that rely on the behavior of surface Dirac fermions. In this work, we grow high quality Bi_2Se_3 films and tune the topological surface state by metal doping on the surface. The atomic structure and morphology of the metal/Bi_2Se_3 are investigated by *in situ* scanning tunneling microcopy. Furthermore, scanning tunneling spectroscopy reveals that the position of Dirac energy can be shifted by as much as 150 meV. These results and comparison with first-principles calculations will be discussed at the meeting.

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