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Two-dimensional d-character Dirac System

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Abstract:

From graphene to topological insulator, Dirac material continues to attract attention of researchers in various fields because of its potential to develop new electronic devices. However, the Dirac material is rare in reality and suffers from the difficulty to incorporate into the current semiconducting industry. In this poster, we will present some of *our recent progresses* on a distinct kind of Dirac material characterized by transition-metal *d* electrons, namely metallosine, composed of transition-metal intercalated epitaxial graphene on SiC(0001). The formation, properties, modulation and stability of the massless Dirac fermions will be discussed. In comparison with graphene, the spin and valley degeneracy can be lifted spontaneously in the *d*-character Dirac materials, which thus hold the promise for the low-power electronic and spintronic applications.