

Examination of inhomogeneous electronic structure in 3D topological insulator Bi_2Te_3

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Studying the inhomogeneous electronic structure in three dimensional topological insulators (3DTI) is important for understanding the effects of local perturbations like impurities or strain which can in turn help us identify the relative importance of the different terms in the Hamiltonian for the system. However, there have been no systematic studies of inhomogeneity of the local density of states in 3DTI. In this study, we probe the surface of the three dimensional topological insulator Bi_2Te_3 using scanning tunneling microscopy (STM). Our data allow us to correlate the position dependence of the Landau levels and quasi particle interference patterns with local features. Based on the experimental results, we present a coherent understanding of how the inhomogeneous electronic structure emerges.