

Symmetry and depth-dependent orders of subsurface defects in Mn-doped Sb(111) studied by using STM

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Sb(111) is a spin textured surface due to the strong spin-orbit coupling, often viewed as a proto-type topological insulator. We used scanning tunneling microscopy (STM) to characterize various Mn-induced subsurface defects existing at the surface of Mn-doped Sb at 50 K. Our STM images show that every defect exhibits 3-fold symmetry with a single rotational orientation and can be categorized by their shapes and sizes. We found more than 10 types of subsurface defects with distinctive orders, which allows the resolution of the vertical positions of the magnetic dopants lying more than 10 layers down from the surface. We will discuss about our findings in comparison with theoretical results.