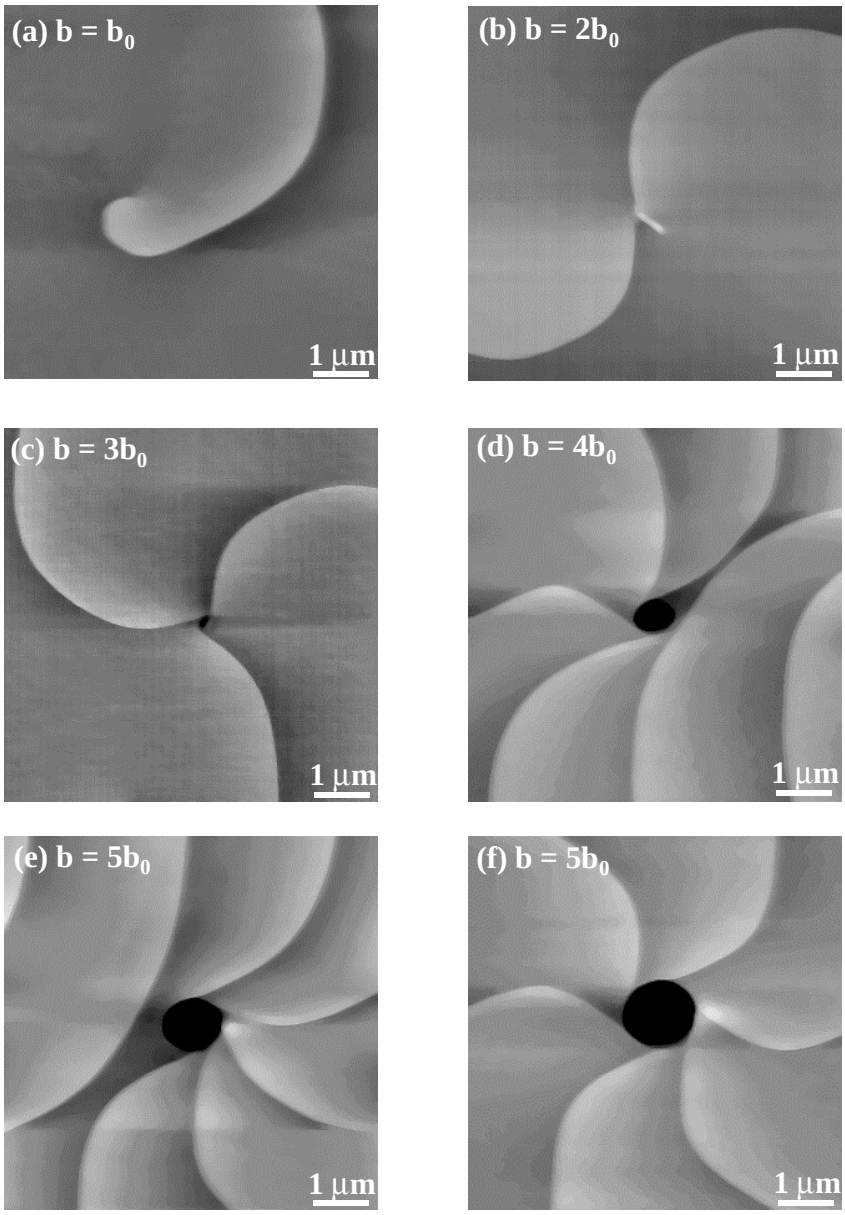
Screw Dislocation Core Destabilization in 6H-SiC



(a) An atomic force microscope image of a unit screw dislocation intersecting the 6H SiC(0001) surface. The step produced at the dislocation core is 15.2 Å high; this is also the magnitude of the Burgers vector, b_0. (b-f) Super screw dislocations, with $b = N\ b_0$ are also observed, where N = 2 (b), 3 (c), 4 (d), 5 (e), and 6 (f). For $b > 3\ b_0$, the strain at the dislocation core destabilizes the crystal in the vicinity of the dislocation line and a hollow tube (black contrast) is formed. The reduction in strain energy is balanced by the energy of the free surfaces bounding the tube. As N increases, the diameter of the tube increases.

Second Place, 1998 ceramographic competition
Classification: Scanning Probe Microscopy

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