

Simulations for Superconducting Thin Films with Honeycomb Pinning Arrays

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Superconductor thin films with honey pinning arrays have shown interesting pinning phenomena which are very different from those of films with square or triangular pinning arrays. Molecular dynamic simulations were made to obtain the ground state vortex distributions at different parameters such as the penetration depth, pinning strength, pinning size and magnetic field. For small pinning site cases, the interstitial positions capture vortices at low magnetic field and the ground distribution tend to be irregular at most magnetic fields. Interesting vortex distributions at large penetration depth and large pinning sites are found which may explain the pinning phenomena found in experiments for the films with honeycomb blind hole array.