

Fermi-surface rearrangement in Bi bicrystals with twisting superconducting crystallite interfaces

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Abstract

We report an investigation of quantum oscillations of Hall resistance and magnetoresistance in Bi bicrystals with superconducting interface of twisting type. From the observed quantum oscillations, we find a similar Fermi surface consisting at interface of bicrystals and bulk nonsuperconducting rhombohedral Bi. At the same time, clear differences are observed in the normal and superconducting behavior of the small and large crystallite disorientation angle interfaces. It is shown that the Fermi surface for electrons in small angle interfaces is less anisotropic and is much larger in volume than in bulk Bi. The considerable change of the shape, elongation, and volume of hole isoenergetic surface at large angle interfaces is revealed.