Ca-doped $Ba_2Cu_3O_{7-\delta}$ bicrystal junctions fabricated on asymmetric $SrTiO_3$ substrates

Authors

- A. Malisa

Abstract

Bicrystal grain–boundary Josephson junctions of Ca–doped $YBa_2Cu_3O_{7-\delta}$ that is $Y_{0.7}Ca_{0.3}Ba_2Cu_3O_{7-\delta}$ were fabricated on three bicrystal $SrTiO_3$ (001) substrates with asymmetric 30°, 40° and 45° orientations. An enhancement of the critical current density in these Ca–doped junctions was observed when compared with normal YBCO grain–boundary junctions with similar angular orientations. The observed increase in the critical current density is large for the junctions fabricated on the asymmetric 30° bicrystal substrate and small or negligible, for those on the asymmetric 45° bicrystal substrate. The critical current was modulated by a magnetic field applied in the plane of the junctions. However, the Fraunhofer pattern observed due to the applied magnetic field deviates from the ideal one.