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Abstract Template

Abrikosov-Josephson vortices relaxation in (Bi, Pb)-2223 bulk system doped with α-Al_2O_3 nanoparticles by means of electric and magnetic measurements.

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Abstract

Another via to confirm the existence of Abrikosov-Josephson (**AJ**) vortices inside of (Bi, Pb)-2223 bulk system is presented. The samples used in this study were obtained by solid-state reaction method doped with different % wt. of **α-Al_2O_3** nanoparticles. The effects of doped with **α-Al_2O_3** nanoparticles are also explain by means of voltage, *V(t)* and magnetic, *M(t)* relaxation measurements, with the aid of standard characterization techniques such as: X-ray diffraction (**XRD**), scanning electron microscopy (**SEM**), electron dispersive X-ray (**EDX**) examinations, atomic force microscopy (**AFM**), $M(H_a)$ dependence in powder samples, and $J_c(0, H_{am})$ dependence in pellet samples. In order to achieve this purpose, the phase´s composition and the unit cell size (from the **XRD** investigations), the surface morphology and the size of the grains (from the **SEM** examinations), the presence and the size of **α-Al_2O_3** (from **EDX** estimations) and (from **AFM** technique), respectively. Finally, the correlation between penetration and magnetic flux trapped (from integral explanation of the $M(H_a)$ dependence in powder samples and $J_c(0, H_{am})$ dependence in pellet samples). All of these results are used to aid the explain the behavior of the voltage and magnetic relaxation as another via to confirm the presence of the (**AJ**) in the region of the planar defects.

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Keywords—*Abrikosov-Josephson vortices, α-Al_2O_3 nanoparticles, (Bi, Pb)-2223 superconductors, relaxation.*

Professional Biography

M. Hernández-Wolpez was born in Camaguey, Cuba in 1976. Bachelor in Sciences in 2000, at the University of East, Santiago de Cuba, Cuba. Master in Physical Sciences in 2007 at the University of Havana, Havana, Cuba. PhD in Physical Sciences in 2018, at the University of East, Santiago de Cuba, Cuba. All the thesis was focused in Condensed Matter. He works as a professor of the Physics Department at the University of Camaguey, Cuba since 2000 up to now. PhD M. Hernández-Wolpez is a member of the Cuban Physical Society (SCF) and the American Physical Society (APS). He has published about 10 articles in specialized magazines. All related to superconducting ceramics, specifically (Bi, Pb)-2223. He has participated in several international congress on related topics.



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