

Abstract Submitted
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Transport characteristics of Co-doped BaFe₂As₂ epitaxial thin film 24deg grain-boundaries P. PANYAJIRAWUT, N. SMITH, University of Wisconsin-Madison, C. TARANTINI, NHMFL, Florida State University, S. LEE, University of Wisconsin-Madison, J. JIANG, NHMFL, Florida State University, C.W. BARK, University of Wisconsin-Madison, J.D. WEISS, NHMFL, Florida State University, C.M. FOLKMAN, S.H. BAEK, University of Wisconsin-Madison, E.E. HELLSTROM, NHMFL, Florida State University, C.B. EOM, University of Wisconsin-Madison, D.C. LARBALESTIER, NHMFL, Florida State University, M.S. RZCHOWSKI, University of Wisconsin-Madison — We investigate [001] 24deg tilt GBs of epitaxial thin film of the pnictide superconductor Co-doped Ba(Fe_{0.92}Co_{0.08})₂As₂ on (001) SrTiO₃ bicrystal substrates. The films were grown by pulsed laser deposition (PLD) with KrF (248 nm) UW excimer laser in vacuum at a base pressure of 2×10^{-7} Torr. The chemical composition of the films determined by wavelength dispersive x-ray spectroscopy (WDS) is Ba : Fe : Co : As : O = 1 : 1.7 : 0.13 : 1.7 : 0.3. Four-circle x-ray diffraction exhibits excellent epitaxy with cube-on cube in-plane epitaxial relationship. The films have an onset T_c of 20.5 K, and a T_{co} of 19.8K. The intragrain J_c is over 1 MA/cm² (4.2K, self field) which is significantly higher than in previously reported thin films. The grain boundary couples at a slightly lower temperature of 19.7 K. We discuss magnetic field and temperature dependence of the IV characteristics, and microwave response.

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