Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Strong pinning centers in high quality Co-doped $BaFe_2As_2$ epitaxial thin film grown on templated substrates CHIARA TARANTINI, Applied Superconductivity Center, National High Magnetic Field Laboratory, Florida State University, Tallahassee, FL, USA, S. LEE, J. JIANG, Y. ZHANG, C.W. BARK, J.D. WEISS, C.T. NELSON, H.W. JANG, C.M. FOLKMAN, S.H. BAEK, J.W. PARK, X.Q. PAN, A. GUREVICH, E.E. HELLSTROM, C.B. EOM, D.C. LARBALESTIER — We report measurements of the field and angular dependences of the critical current density J_c of truly Co-doped $BaFe_2As_2$ epitaxial thin film on $SrTiO_3$/(La,Sr)(Al,Ta)O_3 for different $SrTiO_3$ thickness, which do not exhibit any evidence of electromagnetic weak links and have J_c(4K) values exceeding 1 MA/cm^2 . Those samples show a maximum of the pinning force close to $H/H_{Irr} \sim 0.5$ indicative of strong vortex pinning, a conclusion strengthened by a very strong c-axis peak in the angular dependence $J_c(\theta)$ at fields up to 12 T. In opposition to the H_{c2} anisotropy, J_c for H along the c-axis exceeds J_c for field applied along the ab plane. The microstructural origin of the strong vortex pinning has been investigated by high resolution TEM which reveals a high density of columnar defects, whose nature is currently under study.

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Date submitted: 01 Dec 2009 Electronic form version 1.4