Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Properties of epitaxial $Ba(Fe_{1-x}Co_x)_2As_2$ thin films on different substrates Q.Y. LEI, M. GOLALIKHANI, A. RAFTI, J. QIU, M. HAMBE, Department of Physics, Temple University, F. WILLIAMS, Q. YANG, D. TEMPLE, Applied Research Center, Center for Materials Research, Norfolk State University, E.D. BAUER, F. RONNING, Q.X. JIA, Materials Physics and Applications, Los Alamos National Laboratory, X.F. WANG, X.H. CHEN, Hefei National Laboratory for Physical Sciences at Microscale and Department of Physics, University of science and Technology of China, J.D. WEISS, E.E. HELLSTROM, Applied Superconductivity Center, National High Magnetic Field Laboratory, Florida State University, X.X. XI, Department of Physics, Temple University — We have grown epitaxial, optimally-doped superconducting $Ba(Fe_{0.92}Co_{0.08})_2As_2$ films on $SrTiO_3$, (La, Sr)(Al, Ta)O_3 and $LaAlO_3$ substrates, which have a range of lattice mismatch, and studied the strain effect on the structural and transport properties of the films. We found that the superconducting transition temperature increased as the c lattice constant decreased and a lattice constant increased. The thickness dependence of the superconducting transition temperature was studied, which was related to the strain and strain relaxation. A zero-resistance T_c of 21.7 K was obtained in the 120 nm-thick $Ba(Fe_{0.92}Co_{0.08})_2As_2$ film on $SrTiO_3$ substrate.

Qingyu Lei
Department of Physics, Temple University

Date submitted: 19 Nov 2012 Electronic form version 1.4