

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

In-plane Anisotropic Superconductivity in $\text{YBa}_2\text{Cu}_3\text{O}_{7-\sigma}/\text{BiFeO}_3$ Heterostructure YEN-LIN HUANG, YING-HAO CHU, Material Science and Engineering, National Chaio Tung University — We demonstrate a correlation between the periodic domain structure of multiferroic BiFeO_3 thin films and the anisotropic superconducting of $\text{YBa}_2\text{Cu}_3\text{O}_{7-\sigma}/\text{BiFeO}_3$ heterostructures. Two types of periodic domain structures in BFO – 71° and 109° are used to manipulate the superconductor, YBCO, and an anomalous superconducting behavior, which shows different transition regions parallel or perpendicular to the domain walls of BFO respectively, is observed. The superconducting transition region is much broader when the current goes perpendicularly to the domain walls in BFO than parallel. The difference of T_c is about 40 K, in other words the YBCO shows one dimensional superconducting behavior within 40 K.

Yen-Lin Huang
Material Science and Engineering, National Chaio Tung University

Date submitted: 14 Nov 2013

Electronic form version 1.4