Contribution ID: **481** Type: **Poster Presentation**

Comparison Study of the Flux Pinning Enhancement of YBCO Superconductor with BZO and BZO + Y2O3 Mixed Phase Additions

Tuesday 11 July 2017 13:00 (2 hours)

Adding nanophase defects to YBa2Cu3O7-δ (YBCO) superconductor thin films is well-known to enhance flux pinning, resulting in an increase in current density (Jc). While many previous studies focused on single phase additions, the addition of several phases simultaneously shows promise in improving current density by combining different pinning mechanisms. This paper compares the effect of the addition of two insulating, nonreactive phases of barium zirconium oxide (BZO) and yttrium oxide (Y2O3); both as a single addition of BZO and as a double addition in conjunction with Y2O3. Processing parameters varied the target composition volume percent of BZO from 2-6 vol. %, while maintaining 3 vol. % Y2O3, and the remaining vol. % YBCO. Pulsed laser deposition produced thin films on LaAlO3 (LAO) and SrTiO3 (STO) substrates at various deposition temperatures. Comparison of strong and weak flux pinning mechanisms, current densities, critical temperatures, and microstructures of the resulting films will be presented. The temperature dependence of the current density, Jc(T), will be mathematically modeled to compare the isotropic weak and anisotropic strong pinning contributions.

Authors: Mrs SEBASTIAN, Mary Ann (AFRL / RQQM); Mr EBBING, Charles (UDRI); ZHANG, Wenrui (Purdue University); HUANG, Jijie (Purdue University); Dr WANG, Haiyan (Purdue University); SHIHONG, Chen (University of Kansas); GAUTAM, Bibek (University of Kansas); Dr WU, Judy (University of Kansas); Dr HAUGAN, Timothy (AFRL / RQQM); Dr PANASYUK, George (UES)

Presenter: Mrs SEBASTIAN, Mary Ann (AFRL / RQQM)

Session Classification: M2PoC - Focused Session: Latest Development in Flux Pinning I: Flux Pinning, Critical Currents