



Contribution ID: 1069

Type: **Poster Presentation**

M2Po2B-05 [36]: Flux Pinning Enhancements of Y-Ba-Cu-O Thin Films with Nanosize Magnetic Additions

Tuesday, July 23, 2019 1:30 PM (2 hours)

Different methods of flux pinning are being tested world-wide to enhance critical currents (I_c s) of high temperature superconductor $YBa_2Cu_3O_{7-x}$ (YBCO) coated conductors exposed to high magnetic fields. Magnetic materials are interesting to consider as flux pinning additions because of their potential for very strong pinning strength. To our knowledge, there have been limited demonstrations of magnetic pinning additions to YBCO conductors. This paper describes the study of different M magnetic phase additions to YBCO including M = BaFe₁₂O_x, La_{0.67}Ca_{0.33}MnO₃, and other oxide phases. Nanosize additions were incorporated by depositing multilayer (M/YBCO)N films to minimize degradation of T_c , and testing volume % additions of M phase from 0.5 % to 5%. Results indicate that T_c onsets are depressed with magnetic additions, however in some cases interestingly without degrading the transition width. With optimization of magnetic additions a 50% increase of critical current density has been obtained, for low magnetic fields of < 1T at 65K to 77K. Microstructural and superconducting properties will be summarized, including SEM analysis.

Acknowledgements: Support from the Air Force Office of Scientific Research (AFOSR) and LRIR #18RQ-COR100, and the Aerospace Systems Directorate (AFRL/RQ)

Primary authors: HAUGAN, Timothy (U.S. Air Force Research Laboratory); Mrs SEBASTIAN, Mary Ann (U.S. Air Force Research Laboratory)

Presenter: HAUGAN, Timothy (U.S. Air Force Research Laboratory)

Session Classification: M2Po2B - REBCO, Coated Conductor Processing