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M2Po2E-04: The effect of Ca doped buffer layers on BaHfO3 doped YBa2Cu3O7-x composite multilayer superconducting films

Tuesday 11 July 2023 14:00 (2 hours)

The addition of different insulating, non-reactive nano-phases to YBa2Cu3O7-x (YBCO) superconductor thin films improves current density by combining different flux pinning mechanisms. Additions of BaZrO3, BaSnO3, and BaHfO3 nano-rods has been shown to have positive effects on flux pinning and the resulting current densities attained. In particular, BaHfO3 is an attractive addition since it has less lattice mismatch with YBCO when compared to the lattice mismatch of BZO and YBCO. This research explores the impact of calcium doped YBCO buffer layers (Ca0.3Y0.7Ba2Cu3O7-x) on the BaHfO3 doped YBCO film layers, for multilayer films that are produced by pulsed laser deposition. The combination of calcium doped YBCO buffer layers between BHO doped YBCO layers impacts film microstructure and performance of current density and flux pinning. Current density and pinning force over a wide landscape of 65 –5 K with applied field of 0 -9 Tesla will be presented for these films.

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