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M2Or1B-03 [Invited]: Optimizing Vortex-Pinning in Superconducting Wires

Tuesday 23 July 2019 10:30 (30 minutes)

Engineered nanoscale defects within REBa₂Cu₃O_{7-δ} (REBCO) based coated conductors are of great interest for enhancing vortex-pinning, especially in high-applied magnetic fields. We have conducted extensive research to optimize vortex-pinning and enhance J_c via controlled introduction of various types of nanoscale defects ranging from simple rare-earth oxides and Ba-based perovskites to double perovskite rare-earth tantalates and niobates (Ba₂RETaO₆ and Ba₂RENbO₆). This talk will provide an overview on how density, morphology, and composition of these engineered nanoscale defects affects vortex-pinning in different temperature, field and angular regimes. Detailed microstructural and superconducting properties coated conductors with these engineered defects will be presented. It will be shown that certain nanod defect configurations that provide the best performance at high-operating temperatures also provide the optimal properties at low operating temperatures out to high-applied magnetic fields. The talk will discuss routes to enhance vortex-pinning in both in-situ films and ex-situ films.

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