

Flux Trapping and Field Magnet Stability of Bulk Superconductors

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Abstract - The stability and durability of trapped flux is a focus in investigations of melt-growth (RE)Ba₂Cu₃O_{7-δ} (RE=rare earth, e.g., Y, Gd, Sm) bulk high-temperature superconductors. In magnetic flux engineering applications, two important issues affect the expected performance of bulk superconductors: flux trapping and flux stability or durability. The introduction of effective pinning with homogeneous spatial distribution is inevitable. The materials process and durability studies have been pursued in the last decade with either a stationary or a momentary applied external field. In machine applications, the magnetic flux stability is influenced by external perturbations. We topically summarize our progress and current status in relation to past and ongoing work.

Keywords - Bulk superconductors, RE-Ba-Cu-O HTS, melt growth, nanoparticles, trapped flux density, flux pinning, critical currents.