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Screening Current Induced Field changes during De-energization with Axial Clamping

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The Screening Current Induced Field (SCIF) is a crucial measurement to determine the gross contribution of screening currents in a superconducting coil, specifically coils wound with large aspect ratio, single filament high temperature superconductors (HTS) such as Rare Earth Barium Copper Oxide (REBCO). Our numerical model accurately predicted the behavior of the SCIF shape and magnitude during energizing to full field but diverged on de-energization. We suggest that axial clamping and its associated consequences at high field are responsible for the difference in the computed SCIF upon de-energization. Simple methods of approximating this effect and comparisons between numerical and measurement results are presented.

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