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Granularity-induced field-hysteresis of transport critical current in patterned coated conductors[1] A. A. GAPUD, A. KHAN, University of South Alabama, D. K. CHRISTEN, F. A. LIST III, R. FEENSTRA, Oak Ridge National Laboratory — In superconducting coated conductors such as RABiTS and IBAD films, intergranular misorientations have been effectively minimized, but a small number of local, higher-angle misorientations remain. One important effect of such weak links is the hysteresis of the critical current density J_c with respect to applied field H, brought about when large circulating currents trapped within adjacent grains produce a focused field within the grain *boundaries* (GB's) which can partially cancel out H when applied field is *decreasing*, thus shifting the maximum J_c from zero $H$to a finite field where the local field at the GB is at minimum. This effect has been seen recently in measurements of magnetization (*induced*) currents, but has not been documented using transport (*applied*) current. However, in samples that are *patterned* into conduits 200 μm wide or less, the hysteretic effect on transport J_c is clearly seen. This discrepancy between 'magnetization J_c' and 'transport J_c' may be due to differences in voltage criterion between the two types of measurement, as will be discussed. Systematic measurements and analyses will be presented, along with ramifications for applications.

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