Abstract Submitted for the SES07 Meeting of The American Physical Society

On narrowed coated conductors: granular field-hysteresis effect on transport critical current A.A. GAPUD, University of South Alabama, D.K. CHRISTEN, F.A. LIST III, R. FEENSTRA, Oak Ridge National Laboratory -Superconducting film coated onto flexible metallic tapes – so-called coated conductors – which are being developed for second-generation power transmission lines, are long polycrystals subject to effects of the film's granularity. Although intergranular misorientations have been effectively minimized, local higher-angle misorientations remain. One earmark 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*. This shifts the maximum J_c from zero to a finite H where the local field at the GB is at minimum. This effect has been seen in measurements of *induced* (magnetization) currents, but has not been documented using *transport* (applied) currents that can be percolative. However, in applications where the coated conductor is *patterned* into conduits 100 μ m wide or less, it is possible to effectively channel the percolation across a single GB; the field-focusing effect is well known in transport currents across single GB's. This study shows that, indeed, the effect is clearly manifested in coated conductors narrowed to a few grains wide. Systematic measurements, analyses, and ramifications will be discussed.

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Date submitted: 17 Aug 2007

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