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Scanning Hall probe microscopy of AC losses in YBCO coated conductors RAFAEL DINNER, KATHRYN MOLER, M. R. BEASLEY, Stanford University, D. MATTHEW FELDMANN, DAVID LARBALESTIER, University of Wisconsin—Madison — Magnetic imaging of current-induced vortex movement in superconducting films yields detailed information about dissipation and the path of an applied current. In our cryogenic scanning Hall probe microscope, a micro-Hall probe is rastered near the sample surface with submicron resolution and centimeter scan range. Hall probe time traces taken at each point are assembled into movies of the flux penetration as a function of time over a cycle of AC sample current. We image coated conductors—films of the high-temperature superconductor YBCO grown on metal tapes which give rise to grain boundaries. We then isolate the effects of the boundaries by imaging YBCO grown on bicrystal substrates that induce a single boundary at various angles to the current path. Current density, electric field, and dissipation distributions are reconstructed from the images.

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