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Critical currents in thin-film superconductors via two-coil mutual inductance measurements JOHN DRASKOVIC, JIE YONG, MICHAEL HINTON, ADAM AHMED, Department of Physics, The Ohio State University, SONG WANG, Department of Physics, Stanford University, STANLEY STEERS, THOMAS LEMBERGER, Department of Physics, The Ohio State University — Following Claassen et al.(RSI 1991), we determine the critical current density, $J_c(T)$, in a superconducting thin film by measuring the inductive coupling between two coils located on opposite sides of the film as a function of temperature. For several values of the AC drive magnetic field, we record the temperature at which inductive coupling between the coils jumps dramatically. The peak current density in the film at such temperature is computed by numerical simulation. For thin niobium films, we obtain $J_c(0)$ values greater than 10 percent of the Ginzburg-Landau (GL) prediction with the correct temperature dependence. This suggests the possibility of practical measurement of the GL coherence length in thin films without need for the strong magnetic fields used to measure B_{c2}. Application of this technique to cuprates and pnictides will be discussed.

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