

Abstract Submitted
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Model of vortex dynamics in superconducting films in two-coil measurements of the coherence length¹ THOMAS LEMBERGER, Ohio State Univ - Columbus, YEN LEE LOH, Univ. of North Dakota — In two-coil measurements on superconducting films, a magnetic field from a small coil is applied to the center of the film. When the amplitude of the ac field is increased, the film undergoes a transition from the “Meissner” state to a state with vortices and antivortices. Ultimately, the vortex density matches the applied magnetic field and field screening is negligible. Experimentally, the field at the transition is related to the superconducting coherence length, although a full theory of the relationship is lacking. We show that the mutual inductance between drive and pickup coils, on opposite sides of the film, as a function of ac field amplitude is well-described by a phenomenological model in which vortices and antivortices appear together in the film at the radius where the induced supercurrent is strongest, and then they move through a landscape of moderately strong vortex pinning sites.

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