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Hysteresis in the RF-Induced Flux Lattice Annealing (RIFLA) of the superconducting state in $\mathbf{Pr_{1.85}Ce_{0.15}CuO_{4-y}}$ W.G. CLARK, S.E. BROWN, UCLA Physics and Astronomy, G. GAIDOS, Raytheon, El Segundo, R.L. GREENE, Physics, U. Maryland, H. BALCI, Physics, Kent State U. — We report hysteresis in flux lattice (FL) annealing by an rf magnetic field for the cuprate superconductor $Pr_{1.85}Ce_{0.15}CuO_{4-y}$. A strained FL is formed by placing the sample in the coil (inductance L) of a tuned NMR probe circuit and rotating the coil and sample in a fixed $\boldsymbol{B}$ at low temperature. A series of rf pulses in the coil generates an alternating magnetic field that anneals the FL. It decreases the sample's rf skin depth, which reduces L and increases the resonant frequency (f) of the probe. Rotation in small steps about an axis parallel to the CuO planes and perpendicular to $\boldsymbol{B}$ with annealing after each step generates a peak in f whose shape is the same for rotation in both directions (no rotation hysteresis) and is a maximum for $\boldsymbol{B}$ parallel to the CuO planes. When rotation is done in both directions without annealing, the substantial hysteresis reported here occurs. This work was supported at UCLA by NSF Grants DMR-0334869 and DMR-0804625, and at U. Maryland by NSF Grant DMR- 0653535.

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