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Direct measurement of the absolute value of the magnetic penetration depth in two-dimensional pnictide superconductor $\mathbf{Ca_{10}(Pt_3As_8)[(Fe}_{1-x}\ \mathbf{Pt}_x)_2\mathbf{As_2}]_5$ JEEHOON KIM, FILIP RONNING, LANL, EVGENY NAZARETSKI, BNL, NI NI, J.M. ALLRED, R.J. CAVA, Princeton University, J.D. THOMPSON, R. MOVSHOVICH, LANL — We have measured the absolute value of the magnetic penetration depth λ in a single crystal of the $Ca_{10}(Pt_3As_8)[(Fe_{1-x}\ Pt_x)_2As_2]_5$ ("10-3-8") superconductor using low temperature magnetic force microscopy (MFM). We directly probed local values of λ in the "10-3-8" sample using Meissner response measurements and compared Meissner curves to those obtained in a Nb reference sample. The Meissner response measured at different locations on the sample shows similar behavior indicating homogeneity of the superconducting state, in accord with tunnel-diode resonator measurements. We also discuss larger values of λ in 10-3-8 relative to λ values measured in other pnictide systems.

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