Penetration Depth Measurements of Electrostatically Doped High T\textsubscript{c} Superconductors\textsuperscript{1} JOE KINNEY, University of Minnesota, JAVIER GARCIA-BARRIOCANAL, Universidad Complutense de Madrid, BOYI YANG, ALLEN GOLDMAN, University of Minnesota — The application of field effect transistor concepts to electrostatically dope strongly correlated electron systems has been the focus of intense research [C. H. Ahn et al., Rev. Mod. Phys. 78, 1185 (2006)]. In recent years, we have used this technique to successfully examine magneto-transport properties of YBa\textsubscript{2}Cu\textsubscript{3}O\textsubscript{7-x} and La\textsubscript{2}CuO\textsubscript{4+δ} [X. Leng et al., Phys. Rev. Lett. 107, 027001 (2011)] [X. Leng, et al., Phys. Rev. Lett. 108, 060074 (2012)] [J. Garcia-Barriocanal et al arXiv:1210.7458]. In the work presented here we extend this to include measurements of the penetration depth using a two coil mutual inductance technique. This probe provides an additional window into the underlying properties of the superconducting state as it is electrostatically tuned across the superconductor-insulator phase transition.

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