

Abstract Submitted
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Electrostatic doping of high T_c superconductors¹ JOSEPH KINNEY, JAVIER GARCIA-BARRIOCANAL, XIANG LENG, ALEXEY KOBRINSKII, BOYI YANG, STEPHEN SNYDER, ALLEN GOLDMAN, University of Minnesota — The application of field effect transistor concepts to electrostatically doped strongly correlated electron systems has been the focus of intense research during the last years [C. H. Ahn et al., Rev. Mod. Phys. 78, 1185 (2006)]. In this talk we will show our recent results on Electronic Double Layer Transistor (EDLT) techniques applied to high T_c cuprates. The EDLT configuration, which employs ionic liquids as gate dielectrics, has succeeded in achieving unprecedented charge transfers, of the order of 10^{15} carriers/cm². This large accumulation and depletion of carriers allows us to explore the phase diagram of $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ and $\text{La}_2\text{CuO}_{4+\delta}$. We will focus on the physics of the superconductor to insulator transition [X. Leng et al., Phys. Rev. Lett. 107, 027001 (2011)] and discuss the magneto-transport properties of the underdoped and overdoped regions of the phase diagram [X. Leng, et al., arXiv:1108.0083v1].

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