

Abstract Submitted  
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**A universal fluctuation diamagnetic susceptibility in cuprate superconductor  $\text{Bi}_2\text{Sr}_{2-x}\text{La}_x\text{CuO}_{6+\delta}$** <sup>1</sup> H. XIAO, Center for High Pressure Science and Technology Advanced Research, T. HU, Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, Y. F. YANG, H. Q. LUO, Institute of Physics, Chinese Academy of Sciences, X. M. XIE, Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, X. J. CHEN, H. K. MAO, Center for High Pressure Science and Technology Advanced Research — As we know, superconducting fluctuation appears at temperatures much higher than the superconducting transition temperature  $T_c$  in cuprate superconductors. It is not clear yet that how these fluctuations evolve into a superconducting condensation. In this work, we use torque magnetometer, a sensitive tool to detect magnetic signal, to study these fluctuations in  $\text{Bi}_2\text{Sr}_{2-x}\text{La}_x\text{CuO}_{6+\delta}$  and found a universal condition under which the superconducting transition will occur, no matter the superconductor is underdoped, optimal doped or overdoped. This condition is coincident with a Bose-Einstein condensation (BEC), which reveal the nature of superconductivity in cuprate is of BEC type. The preformed cooper pairs above  $T_c$  can be viewed as bosons and follows a correlation function, which determined the strength of fluctuations.

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