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Two distinct superconducting fluctuation diamagnetisms in $\text{Bi}_2\text{Sr}_{2-x}\text{La}_x\text{CuO}_{6+\delta}$ ¹ H. XIAO, Institute of Physics, Chinese Academy of Sciences — Superconducting fluctuations was studied through the angular dependent torque measurements on a series of $\text{Bi}_2\text{Sr}_{2-x}\text{La}_x\text{CuO}_{6+\delta}$ (BSLCO) single crystals. Two distinct superconducting fluctuation diamagnetism were observed: one is the superconducting thermal fluctuation, with a boundary close to the superconducting phase boundary; while another one, up to the temperature as high as about 180 K, showing maximum signal in the sample with hole carrier density $p = 0.125$, could be due to preformed pairs. In addition, we observed linearly temperature dependent paramagnetic torque signals in BSLCO samples, possibly a result of quantum criticality from a quantum critical point at the optimal doping.

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