

Doping Dependence of Electromagnetic Response in Electron-Doped Cuprate Superconductors

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Within the framework of the kinetic energy driven superconducting mechanism¹, the doping and temperature dependence of the electromagnetic response in the electron-doped cuprate superconductors is studied. In the analogy to the hole-doped case², the low temperature magnetic field profile follows an exponential decay at the surface, while the magnetic field penetration depth depends linearly on temperature except for the strong deviation from the linear characteristics at extremely low temperatures. In particular, the superfluid density exhibits a peak around the critical doping $\delta \approx 0.22$, and then decreases at both lower doped and higher doped regimes.

¹Shiping Feng, Phys. Rev. B **68**, 184501 (2003); Shiping Feng, Tianxing Ma, and Huaiming Guo, Physica C **436**, 14 (2006).

²Shiping Feng, Zheyu Huang, and Huaisong Zhao, Physica C **470**, 1968 (2010).