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标题: Superconducting Fluctuation Investigated by THz Conductivity of La2-xSrxCuO4 Thin Films
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摘要: The frequency-dependent terahertz conductivities of La2-xSrxCuO4 thin films with various carrier concentrations were investigated. The imaginary part of the complex conductivity considerably increased from a temperature far above the zero-resistance superconducting transition temperature T-c(zero), because of the existence of fluctuation in superfluid density with a short lifetime. The onset temperature of the superconducting fluctuation is at most similar to 2T(c)(zero) for underdoped samples, which is consistent with a previous report on the analysis of microwave conductivity. The superconducting fluctuation was not enhanced under a 0.5 T magnetic field. We also found that the temperature dependence of the superconducting fluctuation was sensitive to the carrier concentration of La2-xSrxCuO4, which reflects the difference in the nature of the critical dynamics near the superconducting transition temperature. Our results suggest that the onset temperature of the Nernst signal is not related to the superconducting fluctuation we argued in this paper.
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