SFB/TRR 21 - Seminar
9. Dezember 2010, Stuttgart

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Sub-Terahertz c-axis electrodynamics of $La_{1.875}Sr_{0.125}CuO_4$

Direct measurements of conductivity and dielectric permittivity spectra of single crystalline “1/8” - cuprate $La_{1.875}Sr_{0.125}CuO_4$ are performed at frequencies 9 cm^{-1} – 40 cm^{-1} and temperatures 5 K – 300 K, for polarization of the electric field vector perpendicular to the CuO planes (E||c). An excitation with the strongly temperature dependent parameters is observed in the superconducting (SC) state and its origin is associated with the transverse Josephson plasma mode. It is suggested that the mode is caused by an interplane interaction of charge and magnetically ordered regions (stripes) that leads to a modulation of Josephson coupling strength along the c-axis in the unit cell of $La_{1.875}Sr_{0.125}CuO_4$. Strongly enhanced conductivity (absorption) is observed in the SC state for frequencies below the SC gap frequency. This excess absorption is assigned to an interplane channel of quasiparticles transport between non-superconducting magnetic stripes.

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