386. Title:Anomaly in the complex conductivity of overdoped Y1-x Ca x Ba2Cu3O7-δ thin films from thz spectroscopy
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Abstract:We measured the complex conductivity of Ca-doped YBCO thin films in the THz frequency range. The films were measured using both Time domain and Frequency domain methods for THz spectroscopy. We show that a subgap exists in the overdoped samples of 5% and 10% Ca doping. The subgap appears as a sharp decrease in the real part of conductivity at frequencies equivalent to gap energy of 1 meV and is more prominent with increased doping. We suggest that this decrease in conductivity is related to a d-{x{2}-y{2}} -wave pairing symmetry with an imaginary part of is or id xy . The imaginary part of the conductivity shows the well-known 1/ω behavior, but its ωσ 2 product shows a dip in the spectrum at about ∼1 meV.