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Terahertz transient photoconductivity of insulating cuprates J. STEVEN DODGE, JESSE PETERSEN, AMIR FARAHANI, DEREK SAHOTA, Simon Fraser University, RUIXING LIANG, University of British Columbia — We establish a detailed phenomenology of photocarrier transport in the copper oxide plane by studying the terahertz transient photoconductivity of $Sr_2CuO_2Cl_2$ and $YBa_2Cu_3O_6$. We observe a common dependence on time, fluence, and temperature. We infer an intrinsic photocarrier mobility from the peak photoconductivity, and show that its temperature dependence can be associated with scattering from thermal excitations. The initial photoconductivity decay rate is independent of fluence, indicating a lack of interaction among photoexcitations. We observe a crossover with time, to a thermalized regime characterized by hopping conductivity with a low activation energy.

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