

Abstract Submitted  
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**Visible-pump, THz-probe measurement of the photocarrier mobility in an undoped cuprate** JESSE PETERSEN, J. STEVEN DODGE, Simon Fraser University, RUIXING LIANG, University of British Columbia — We present new experimental results on the mobility of photoexcited carriers in  $\text{Sr}_2\text{CuCl}_2\text{O}_2$ , an undoped cuprate. We use ultrafast laser pulses to excite photocarriers in the antiferromagnetic insulating lattice. We then probe the low-frequency dynamical conductivity of the resulting nonequilibrium state with time-domain terahertz spectroscopy. We observe the prompt onset of photoconductivity followed by a non-exponential decay on ps timescales. Assuming all photoexcited carriers are free we observe a peak mobility of  $\sim 0.1 \text{ cm}^2/\text{Vs}$ , much lower than the Hall mobility in chemically doped systems with similar carrier concentrations <sup>1</sup>. Such a low mobility suggests the formation of polarons or excitons after photoexcitation. We will also discuss the temperature dependence of the nonequilibrium state.

<sup>1</sup>Y. Ando *et al.* PRL **87** 017001 (2001)

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