

# High THz field induced dynamics of Sr<sub>14</sub>Cu<sub>24</sub>O<sub>41</sub>

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Dynamical studies of far infrared excitations in materials have become possible following the recent development of techniques that enable the generation of terahertz electromagnetic radiation with high electric field values [1]. This energy range is extremely relevant for the study of many charge density wave compounds, which exhibit low frequency excitations associated with a collective response due to pinning. Sr<sub>14</sub>Cu<sub>24</sub>O<sub>41</sub> is a quasi one-dimensional material whose structure consists of alternating layers of Cu<sub>2</sub>O<sub>3</sub> chains and CuO<sub>2</sub> ladders [2]. Both substructures become charge ordered below ~200K. Understanding the dynamics of Sr<sub>14</sub>Cu<sub>24</sub>O<sub>41</sub> excitations in the far infrared has the potential not only to shed light onto the complex nature of charge ordering in this material, but also to help provide a better understanding of the nature of superconducting behavior in two-dimensional high temperature superconducting cuprates. In our work, high field terahertz pulses are used to investigate the static and dynamic properties of single crystal Sr<sub>14</sub>Cu<sub>24</sub>O<sub>41</sub> samples grown by the traveling solvent floating zone method. We will present preliminary results of a field and time dependent terahertz study of Sr<sub>14</sub>Cu<sub>24</sub>O<sub>41</sub>.

[1] P. U. Jepsen et al., *Laser Phot Rev* 5, 124 (2011)

[2] B. Gorshunov et al., *Phys Rev B* 66, 060508 (2002)

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