



IFMP Seminar

Date Wednesday, January 25, 2023, at 13:00

Room: HSZ/204

BigBlueButton: <https://bbb.tu-dresden.de/b/dar-mbs-me8-gsc>

Speaker **Tim Priessnitz**
MPI-FKF, Stuttgart

Title **Broadband THz Emission and THz High Harmonic Generation in the Delafossite PdCoO₂**

Abstract Terahertz (THz) radiation became a powerful tool with widespread applications ranging from imaging and spectroscopy to nonlinear optical control of materials. However, efficient and scalable THz sources remain rare. Here, we present a novel approach to generate THz radiation making use of an ultrafast current induced via the transverse thermoelectric effect (TTE). We realize this in off-cut grown thin films of the delafossite PdCoO₂ and the cuprate La_{1.84}Sr_{0.16}CuO₄ driven by ~200 fs laser pulses resulting in an ultrafast transient diffusion of charge carriers. We will show an extended characterization of the TTE-based THz generation by means of THz emission spectroscopy and will provide a first basic phenomenological model. Furthermore, we will discuss the finding of THz generation in the light of varying laser fluence, the application of an external magnetic field and low temperatures. Coming from a broadband THz generation mechanism with a promising application potential, we also investigated the nonlinear transport by means of THz high harmonic generation (HHG) spectroscopy. Optical phenomena such as THz HHG are proposed to provide a more efficient way to probe of exotic transport effects, such as hydrodynamic electron flow, than previously studied DC transport measurements, which identified the delafossite PdCoO₂ as another candidate to observe such properties. We will present and discuss polarization and temperature dependent THz HHG from PdCoO₂ thin films that shows potential signatures of hydrodynamic transport, contributing to the ongoing discussion of the low-temperature origins of THz HHG.

Host: S. Kaiser

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