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Towards Direct DC Conductivity of Warm Dense Matter Measured by Single-Shot THz Spectroscopy[1] BENJAMIN OFORI-OKAI, SLAC - Natl Accelerator Lab, BRANDON RUSSELL, University of Alberta, ZHI-JIANG CHEN, SLAC - Natl Accelerator Lab, YING TSUI, University of Alberta, SIEGFRIED GLENZER, SLAC - Natl Accelerator Lab — Single-shot terahertz time-domain spectroscopy (THz-TDS) is a promising tool for characterizing properties of materials undergoing irreversible changes (e.g. the complex refractive index or conductivity). The drawback to this is the low signal-to-noise ratio. Maximizing this is important for studies of irreversible processes with small signals or modulation. We present a method for balancing shot-to-shot fluctuations based on: (a) simultaneous detection of single-shot traces, and (b) the use of correlation functions. The method is compared against the state of the art polarization-gated balancing scheme. We use our technique to determine the conductivity of a gold thin film using a transmission configuration. Finally, we present preliminary results on laser heated gold films.

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