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SFB 1242 Nichtgleichgewichtsdynamik kondensierter Materie in der Zeitdomäne

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Discovering carrier dynamics on the nanoscale with subwavelength terahertz techniques

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Light carrying frequencies in the terahertz range has been widely used to study carrier dynamics in semiconductors since the plasma frequencies of these mostly fall within the terahertz range. Using proper models based on Drude theory, measurements of the plasma frequency can be exchanged for information such as the electron mobility, DC conductivity, sheet conductance, etc. Extracting such material parameters in an all-optical measurement i.e. without direct contact to the material is highly desired in fields such as electrical engineering or materials engineering, where optimum electrical properties are crucial.

A major challenge for terahertz imaging is that the diffraction limit dictates that a terahertz beam only can be focused to a beam spot size that is hundreds of microns or larger. This has led to the development of terahertz near-field imaging techniques that today is able to beat the diffraction limit by more than 10.000 times. In this presentation, an overview of today's terahertz techniques is given, with the aim of studying carrier dynamics in nanostructured materials for future integrated circuits and solar cell applications.

Für diese Zeit steht eine Kinderbetreuung nach vorheriger Anmeldung zur Verfügung.

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