

Seminar

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Phase-resolved Terahertz nano-imaging of WTe_2 microcrystal

The terahertz electrodynamics of few-layer WTe_2 is dominated by the plasmon response. However, terahertz surface plasmons with ultra-long wavelength in two-dimensional exfoliated crystals are typically confined by the lateral geometry. Direct visualization of the fringe pattern is challenging due to the confinement and the low quality-factor of the surface plasmon. In this talk, we demonstrate a novel method to efficiently acquire the carrier-envelop-phase of the pulsed signal in the terahertz near-field imaging measurement. The surface plasmon in the few-layer WTe_2 exhibit characteristic features on the edge of the sample in the phase channel down to 33 K. The phase-resolving method improves the traditional technique used in pulsed-based terahertz imaging application by providing the full complex signal. We determined the temperature dependent terahertz conductivity utilizing the complex near-field signal images, with few-layer WTe_2 as an example.