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Nanoimaging and control of polaritons in 2D materials

A promising solution for active control of light on the nanometer scale are plasmons in graphene, which offer ultra-short wavelengths, long lifetimes, strong field confinement, and tuning possibilities by electrical gating. Here, we discuss scattering-type scanning near-field optical microscopy (s-SNOM) for real-space imaging of graphene plasmons [1-3] in nanoresonators [4] and hBN-graphene heterostructures [5]. We also introduce THz near-field photocurrent nanoscopy and discuss its application for imaging acoustic graphene plasmons in a graphene-based THz detector [6]. Further, we discuss ultraslow hyperbolic volume and surface phonon polaritons in boron nitride flakes [7,8].

References

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Figures

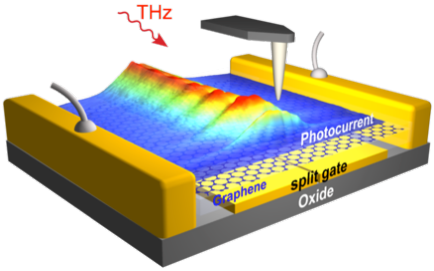

Figure 1: THz plasmons of extremely short wavelength propagate along the graphene sheet of a THz detector, as visualized with photocurrent images obtained by scanning probe microscopy.