Abstract Submitted
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Terahertz generation and picosecond photo-thermoelectric currents in graphene[1] ALEXANDER HOLLEITNER, Technical University Munich, Walter Schottky Institut and Physics Department — We demonstrate that THz radiation is generated in optically pumped bilayer graphene. The electro-magnetic radiation is detected via a time-domain THz spectroscopy utilizing coplanar metal stripline circuits in combination with an on-chip pump/probe scheme [1]. The striplines act as highly sensitive near-field antennae with a bandwidth of up to 1 THz. Our ultrafast experiments further clarify the optoelectronic mechanisms contributing to the photocurrent generation at graphene-metal interfaces. We verify that both built-in electric fields, similar to those in semiconductor-metal interfaces, and a photo-thermoelectric effect give rise to the photocurrent at graphene-metal interfaces at different time scales. We particularly discuss how the picosecond photocurrents in monolayer graphene depend on the geometry and the thermal coupling of the devices to the environment [2]. We acknowledge the very fruitful cooperation with L. Prechtel, S. Manus, D. Schuh, W. Wegscheider, L. Song, and P. Ajayan.

[1] L. Prechtel, L. Song, P. Ajayan, D. Schuh, W. Wegscheider, A.W. Holleitner, Nature Communications 3, 646 (2012).
[2] A. Brenneis et al. (2013).

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