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Ultrafast photocurrents in monolayer MoS₂¹ ERIC PARZINGER, URSULA WURSTBAUER, ALEXANDER W. HOLLEITNER, Walter Schottky Institute and Physics-Department, Technical University of Munich, Germany — Two-dimensional transition metal dichalcogenides such as MoS₂ have emerged as interesting materials for optoelectronic devices. In particular, the ultrafast dynamics and lifetimes of photoexcited charge carriers have attracted great interest during the last years. We investigate the photocurrent response of monolayer MoS₂ on a picosecond time scale utilizing a recently developed pump-probe spectroscopy technique based on coplanar striplines. We discuss the ultrafast dynamics within MoS₂ including photo-thermoelectric currents and the impact of built-in fields due to Schottky barriers as well as the Fermi level pinning at the contact region.

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