SFB1242

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Nichtgleichgewichtsdynamik kondensierter Materie in der Zeitdomäne

UNIVERSITÄT DUISBURG ESSEN

Open-Minded

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Ultrafast switching to a metastable hidden quantum state in 1*T*-TaS_2 dichalcogenide

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Importance of optical control of phase transitions in correlated many–body systems is twofold. First and foremost, investigation of how to reversibly switch states by optical excitation in detail could shed light on understanding of the underlying switching mechanism. By employing suitable experimental technique to study the coherent modulation of electronic and optical properties triggered by a laser pulse we can learn how to coherently manipulate a many–body system. Secondly, elucidating the underlying switching mechanism has practical value as it could lead consequently to applications in high frequency data processing devices.

In this talk I will present an ultrafast relaxation dynamics study in 1*T*-TaS_2 dichalcogenide in the strong excitation regime. The core of my talk will be assigned to the discovery of bistable switching to a new hidden, spontaneously ordered macroscopic quantum state in 1*T*-TaS_2, induced by a single femtosecond laser pulse. The ultrafast switching to a hidden state is repeatable and accompanied with a change in reflectivity and DC resistance, opening a new possibility of a generation of ultrafast non-volatile memory devices.

Reference:
L. Stojchevska, *et al.*, *Science* **344**, 177 (2014).

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

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