



Experimentelle
Physik 2

Seminar Festkörperphysik (CMP Seminar)

Aktuelle Probleme der Festkörperphysik für Studenten und Mitarbeiter
020236 Kolloquium/Seminar SS 25

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Coherent interaction of 2s and 1s exciton states in TMDC monolayers

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We use femtosecond pump-probe spectroscopy to study the coherent interaction of excited exciton states in WSe₂ and MoSe₂ monolayers via the optical Stark effect. For co-circularly polarized pump and probe, we measure a blueshift which points to a repulsive interaction between the 2s and 1s exciton states. The determined 2s-1s interaction strength is on par with that of the 1s-1s, in agreement with the semiconductor Bloch equations. Furthermore, we demonstrate the existence of a 2s-1s biexciton bound state in the cross-circular configuration in both materials and determine their binding energy. Recently, we have started to investigate the influence of dielectric screening on the interaction strength and the interaction between attractive polarons.