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Aktuelle Fragen
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Nonlinear light generation in atomically thin transition metal dichalcogenides

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The linear optical properties of transition metal dichalcogenides (TMDCs), such as MoS_2 or WSe_2, are well known and dominated by excitons. In the nonlinear regime, second and third harmonic generation as well as two-photon photoluminescence can be observed. However, their origin is not fully understood.
In this talk, our latest work on nonlinear light emission in ultrathin TMDCs will be presented. We use broadband infrared femtosecond laser pulses to investigate mechanically exfoliated and artificially grown TMDCs of different thickness. We find that excitonic states also dominate the second harmonic emission in these materials. Furthermore, the hexagonal non-centrosymmetric crystal lattice governs the polarization of the second harmonic emission. This effect is used to determine the crystal orientation and to make grain boundaries visible. Furthermore, we will discuss ways of distinguishing between exciton-enhanced second harmonic emission and two-photon photoluminescence.