Light-matter interaction in 2D materials: from graphene to TMDs

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Graphene and other atomically thin transition metal dichalcogenides (TMDs), as exceptional two dimensional materials, possess extremely promising potential for fundamental studies and practical applications. Here we report our studies on 2D materials such as graphene, MoS2, TaSe2 and WS2. Photons, electrons, phonons and the interaction among them are systematically investigated through various optical probes. The results presented here are highly relevant to the application of 2D materials in nano-electronics and optoelectronics and help in developing a better understanding of the optical and electrical properties of these 2D materials.