Tunable nonlinear optical response from 2D materials

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Atomically thin two dimensional materials such as graphene and transition metal dichalcogenide monolayers have recently spurred a great of interests due to their unique mechanic, electronic, optical and magnetic properties. And often these properties could be greatly tuned by external stimuli such as electric, magnetic and force field. Individual member in this class of 2D materials is characteristic in term of structural symmetry. Moreover, the structural symmetry could also be tuned, depending on how monolayers are stacked on one another. These variations in symmetry have given rise to even richer properties among different 2D materials and their homo-/hetero-structures. Therefore, they provide a new playground for nonlinear optics because of its sensitivity to structural symmetry. Vice versa, nonlinear optics becomes a powerful technique to study 2D materials. In this talk, I will present some of our recent results on nonlinear optical microscopy and spectroscopy of 2D materials [1-4].

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