Graphene-Enabled Chemometric Raman Imaging

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Graphene is an ideal material for photonics and optoelectronics, where the combination of its optical and electronic properties can be fully exploited, and the absence can be beneficial. Saturable absorption is observed as a consequence of Pauli blocking and can be exploited for mode-locking of a variety of ultrafast and broadband lasers. Stimulated Raman Scattering offers sub-cellular spatial resolution and molecular-specific contrast. It enables label-free chemically-specific imaging by detecting the vibrational properties of tissues. I will overview the development of mode-locked lasers based on graphene and related materials and their application in a broadband coherent Raman platform exploiting an all-fiber dual wavelength self-synchronized laser.