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Raman Spectroscopy of Atomically Thin MX_2 Materials STEVEN DRAPCHO, JONGHWAN KIM, XIAOPING HONG, CHENHAO JIN, SUFEI SHI, Dept. of Physics, University of California, Berkeley, CA 94720, USA, YU ZHANG, Dept. of Mat. Science and Engineering, Peking University, Beijing 100871, China, SEFAATTIN TONGAY, School for Engineering of Matter, Transport and Energy, Arizona State University, Tempe, Arizona 85287, USA, JONGMIN YUK, ALEX ZETTL, Dept. of Physics, University of California, Berkeley, CA 94720, USA, JUNQIAO WU, Dept. of Mat. Science and Engineering, University of California, Berkeley, CA 94720, USA, YANFENG ZHANG, Dept. of Mat. Science and Engineering, Peking University, Beijing 100871, China, FENG WANG, Dept. of Physics, University of California, Berkeley, CA 94720, USA — There has been growing interest in atomically thin layers of MX_2 materials, such as MoS_2, WS_2, $MoSe_2$, and WSe_2. Monolayers of these materials exhibit many physical properties distinctly different from those of bulk crystals, such as a direct rather than an indirect band gap, strong photoluminescence, and large exciton binding energies. Raman spectroscopy provides a powerful tool to characterize atomically thin 2D materials, having been utilized to probe the electron-phonon coupling and identify the layer thickness of MX_2 materials. To better understand Raman spectra, we perform systematic studies of Raman scattering in different MX_2 materials as a function of the photon excitation energy, light polarization, and spatial position. I will discuss their implications for quantitative characterization of MX_2 materials using Raman spectroscopy.

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