Control of exciton-phonon interaction in monolayer WSe$_2$

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Abstract

Transition metal dichalcogenides (TMDs) form layered compounds [1], which recently came into the focus of vigorous research activity due to the various pathways to produce them in single- and few-layer form. Raman spectroscopy is a standard procedure in the characterization dimensionality of TMDs [2]. We study the three main Raman peaks of monolayer WSe$_2$ in a field effect transistor with polymer electrolyte gating, which offer a superior electrostatic control over the charge density in the channel. We find that positions, intensities and widths of these peaks change as a function of doping level due to exciton-phonon and electron-phonon interaction.

References


Figure 1: Evolution of Raman signal with voltage on electrolyte gate.