

A controllable atomically-thin light-emitting diode

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Abstract

Atomically-thin semiconductor heterostructures are ideal systems for exploring strong light-matter interactions in the 2D limit. When electrons and holes are individually injected into these materials, they can bind to form interlayer excitons that emit light upon recombination. In this work, we study the electroluminescence of interlayer excitons in a MoSe₂/WSe₂-based heterostructure under forward bias. By combining electroluminescence and photoluminescence spectroscopy, we demonstrate spatially and electrically controllable exciton recombination and diode-like emission behavior. These results highlight the potential of semiconducting heterostructures for developing excitonic light sources and investigating many-body physics in low-dimensional systems.