

Abstract Submitted
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Observation of Interlayer Excitons in Monolayer MoSe₂-WSe₂ Heterostructure on BN Substrate¹ ALICE HUANG, Rutgers University , ESSANCE RAY, KYLE SEYLER , PASQUAL RIVERA , ERIC WONG , PAUL NYUGEN, GENEVIEVE CLARK, XIAODONG XU, University of Washington, GROUP OF XIAODONG XU TEAM — Interlayer excitons have previously been observed in monolayer MX₂ heterostructures exhibiting type II band alignment. Specically, interlayer excitons in MoSe₂-WSe₂ heterostructures have been thoroughly characterized with photoluminescence (PL) and photoluminescence excitation spectroscopy (PLE). However, electrical control of the interlayer exciton exhibits PL intensity dependence that is inconsistent with the dipole and electric field model - possibly owing to carrier charge effects - and requires further elucidation. The addition of BN substrate, which has been shown to (1) smooth the surface and (2) reduce carrier charge inhomogeneity of graphene devices, presents itself as a potential solution. In this preliminary study, we fabricated an MoSe₂-WSe₂ heterostructure on BN substrate. Photoluminescence (PL) measurements on the device confirm the presence of interlayer excitons at approximately 1.40 eV, consistent with MoSe₂-WSe₂ heterostructures. Furthermore, the PL characterization reveals unreported spectral features for both the interlayer and intralayer excitons.

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