

Abstract Submitted
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Scanning Photocurrent Microscopy on Single-Layer CVD MoS₂, MoSe₂, and Alloys EDWIN PRECIADO, VELVETH KLEE, DAVID BARROSO, Univ of California - Riverside, KRISTOPHER ERICKSON, Sandia NL, MARK TRIPLETT, Univ of California - Davis, ARIANA NGUYEN, CHRIS LEE, I-HSI LU, SARAH BOBEK, JOHN MANN, Univ of California - Riverside, ALEC TALIN, FRANCOIS LEONARD, Sandia NL, LUDWIG BARTELS, Univ of California - Riverside — We report scanning photocurrent measurements on CVD-grown single-layer films of MoS₂, MoSe₂, and MoS₂(1-x)Se_{2x} alloys. Measurements at different irradiation intensity reveal a superlinear photoresponse irrespective of the material composition. We find photocurrents that decrease and IV-behavior that becomes more linear with increasing selenium contents. Measurements in dependence of the channel width indicate carrier diffusion length on the order of 0.9 micron for MoS₂ and 0.5 micron for MoSe₂. Concomitant thermal imaging rule out thermal defects. Time-dependent measurements suggest long-lived traps for MoS₂ based materials that are absent for MoSe₂-based materials.

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