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Spatially-Resolved Photoluminescence and Photocurrent Spectroscopy of CdS Nanosheet Devices[1] A. WADE, P. KUMAR, H.E. JACKSON, L.M. SMITH, University of Cincinnati, J.M. YARRISON-RICE, Miami University, Y.J. CHOI, J.G. PARK, KIST — We present a comparison of spatially-resolved photocurrent(PC) and photoluminescence(PL) images from single CdS nanosheet(NS) devices. Electrical Ti/Al contacts are fabricated across a single CdS NS using photolithography and liftoff. Dark I-V characterization shows back-to-back Schottky barriers with an unintentional doping of $\sim 10^{16}$ cm^{-3}. Spatially-resolved above-gap PC imaging at room temperature shows that PC is most efficient for light absorbed near the reverse biased contact. Separately, a set of devices were fabricated using Ar^+ bombardment to create donor sulfur vacancies at the contacts. Imaging of the implanted NS devices shows the most efficient PC occurring away from the contacts. We investigate the electric field profiles of these same devices via the Stark effect by using spatially-resolved PL as a function of temperature.

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