

Abstract Submitted
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J-V Distortion of CIGS Solar Cells with Sputtered Zn(O,S) Buffer Layer¹ TAO SONG, J. TYLER MCGOFFIN, RUSSELL GEISTHARDT, Department of Physics, Colorado State University, KANNAN RAMANATHAN, National Renewable Energy Laboratory, JAMES SITES, Department of Physics, Colorado State University, NATIONAL RENEWABLE ENERGY LABORATORY COLLABORATION — Sputtered-deposited Zn(O,S) is an attractive alternative to CdS for Cu(In,Ga)Se₂ (CIGS) thin-film solar cells' buffer layer. It has a wider band gap and thus allows greater blue photon collection to achieve higher photon current. A key parameter for the sputtering deposition of Zn(O,S) has been the oxygen fraction in the argon sputtering beam. Current-Voltage (J-V) distortion, observed in some cases, varied with oxygen fraction in Zn(O,S). The details are in good agreement with predictions of a photodiode model, in which a conduction-band offset (CBO)-induced barrier at the buffer-absorber interface is responsible for the distortions (both red kink and crossover). Varying oxygen fraction in Zn(O,S) may play a role in adjusting the CBO at the interface and thus modulating the J-V distortion.

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