

Abstract Submitted  
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**Advances in all-sputtered CdTe solar cells on flexible substrates<sup>1</sup>**

KRISTOPHER WIELAND, HASITHA MAHABADUGE, ANTHONY VASKO, ALVIN COMPAAN, The University of Toledo, DEPARTMENT OF PHYSICS AND ASTRONOMY COLLABORATION — The University of Toledo II-VI semiconductor group has developed magnetron sputtering (MS) for the deposition of thin films of CdS, CdTe, and related materials for photovoltaic applications. On glass superstrates, we have reached air mass 1.5 efficiencies of 14%. [1] Recently we have studied the use of MS for the fabrication of thin-film CdS/CdTe cells on flexible polyimide superstrates. This takes advantage of the high film quality that can be achieved at substrate temperatures below 300 C when RF MS is used. Our recent CdS/CdTe solar cells have reached 10.5% on flexible polyimide substrates. [2] This all-sputtered cell (except for back contact) has a structure of polyimide/ZnO:Al/ZnO/CdS/CdTe/Cu/Au. The physics of this device will be discussed through the use of spectral quantum efficiency and current-voltage measurements as a function of CdTe layer thickness. Pathways toward further increases in device efficiencies will also be discussed. [1] Appl. Phys. Lett. 85, 684 (2004) [2] Phys. Stat. Sol. (B) 241, No. 3, 779–782 (2004)

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