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Development of A Hybrid System for Laser Scribing and Characterization by Laser Beam Induced Current JONATHAN L. DEWITT, JON M. STONE, JOHN ROYSTON, RYAN ZELLER, MEGHAN R. MAPES, PAUL J. ROLAND, ZHAONING SONG, RANDY J. ELLINGSON, ADAM B. PHILLIPS, MICHAEL J. HEBEN, University of Toledo, WRIGHT CENTER FOR PHOTOVOLATICS INNOVATION AND COMMERCIALIZATION COLLABORATION, UNIVERSITY OF TOLEDO DEPARTMENT OF PHYSICS AND ASTRONOMY COLLABORATION — A hybrid system was developed for laser scribing and photovoltaic characterization for defect analysis of devices. In the scribing configuration, the system can isolate individual cells on a research scale device or perform the scribes necessary to integrate a module. In addition to scribing, the system can characterize photovoltaic effects of samples ranging in size from research sized devices to full modules with a resolution of 40 microns. High peak power lasers with wavelengths of 1064 nm, 532 nm, and 355 nm, which add flexibility to the system, are available for this system. For scribing the high power and multiple wavelengths allow the user to scribe most materials. For the Laser Beam Induced Current (LBIC) measurements the power of the system can be reduced and the appropriate wavelength can be selected to generate electron-hole pairs in the sample. For both of these configurations, the laser beam position and focal point are directed by galvanostatic mirrors and lens, respectively. In the LBIC configuration additional data acquisition software was developed. Data analysis software was also developed to manipulate data file and generate current maps.

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