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Micro-Photoluminescence for Optoelectronic Material Characterization EMIR MAGDEN, VICTOR MINDEN, COREY SHEMELYA, THOMAS VANDERVELDE, Tufts University — A hardware environment and software bundle have been developed for measuring the absolute value of and the variance in photoluminescence (PL) intensity across samples of optoelectrical materials. The fully automated assembly uses a dual-axis translation stage to allow for "micro-PL" measurements of the sample surface with a resolution of 10 microns on either axis. The user is given the option to digitally adjust the boundaries of the area being mapped, and set the measurement resolution to produce coarse or fine detailed PL maps of the sample surface. By using a monochromator, the system can perform preliminary measurements of PL at wavelengths ranging from 400nm to 1.7um, and determine the optimal spectral operation settings for detailed mapping. Since the system is a modular design, components can be switched to operate in other spectra ranges as well. As all components are digitally controlled by a PC, a universal user interface and integration module has been created to allow for simultaneous operation of all components with minimal user interaction, and intuitive representations of final data for material quality assessment. Various materials are characterized and discussed to demonstrate the utility.

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