

DMD-Based Quantum Efficiency Mapping and Self-Healing of Hybrid Diffuser Dispensers

Eric Montgomery (UMD)

Digital micromirror devices (DMDs), originally developed for projection TV, here find application as a spatial light modulator for fast, high resolution, in-situ quantum efficiency (QE) mapping. We report resolution of 50 microns and discuss advantages and limitations of the technique. We also report progress on a hybrid diffuser dispenser photocathode, a new concept which combines controlled porosity and low mass flow, and image its QE with the DMD system. Lastly, we contaminate the cesiated tungsten surface of the dispenser via controlled atmospheric exposure to more than 100 Langmuirs of oxygen and water vapor, subsequently and repeatably achieving excellent recovery of QE by diffusing additional cesium from the sub-surface reservoir. Self-healing is thereby demonstrated for the first time in a controlled porosity dispenser photocathode; prospects for further increases in QE of self-healing photocathodes are discussed.