

Synchrotron Based Studies of Detectors and Photocathodes

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Materials analysis tools provide a great opportunity to optimize semiconductor materials for specific applications. For x-ray detectors, this includes x-ray beam induced current mapping at various photon energies to determine charge transport properties, and x-ray topography to identify the cause of electrically active defects in the material. For multi-element thin film semiconductor applications, such as photocathodes, x-ray diffraction, fluorescence and reflectivity can be used to develop an in situ picture of how the material forms and how the roughness evolves. This presentation will focus on development of diamond based x-ray detectors, and on in situ monitoring of alkali antimonide photocathode growth, two programs which have benefitted greatly from x-ray analysis techniques.