

Abstract Submitted
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Ultraviolet-Infrared dual band detector using ZnO/PbS composite nanostructure¹ P.K.D.D.P. PITIGALA, P.V.V. JAYAWEERA, J. SHAO, K. TENNAKONE, A.G.U. PERERA, Department of Physics and Astronomy, Georgia State University, Atlanta, Georgia 30303, USA, P.M. JAYAWEERA, Department of Chemistry, University of Sri Jayewardenepura, Nugegoda, Sri Lanka, J. BALTRUSAITIS, Central Microscopy Research Facility, University of Iowa, Iowa City, Iowa 52242, USA — Sensors for detecting ultraviolet (UV) and near-infrared (NIR) photons, fabricated by complex epitaxial methods are costly. A low cost UV-NIR detector is fabricated using ZnO nonporous powder and PbS quantum size particles is demonstrated. A nonporous film of ZnO was fabricated on Fluorine doped Tin Oxide (FTO) glass with a scribe, separating the FTO layer in to two electrodes. PbS quantum particles were composites on the ZnO film by wetting the film using a solution of lead acetate in ethanol and passing a stream of H₂S gas on top of the film. When a bias voltage is applied across the electrodes the device shows two response peaks, around 380nm (UV) and 800nm (NIR). These two responses are resulted due to bandgap excitation of ZnO (~ 3.2 eV) and PbS (~ 0.9 eV) quantum particles.

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