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AlGaN based Tunable Hyperspectral Detector: Growth and Device Structure Optimization NEERAJ TRIPATHI, JAMES R. GRANDUSKY, VIBHU JINDAL, FATEMEH SHAHEDIPOUR-SANDVIK, College of Nanoscale Science and Engineering, University at Albany, L. DOUGLAS BELL, Jet Propulsion Laboratory, California Institute of Technology, COLLEGE OF NANOSCALE SCIENCE AND ENGINEERING, UNIVERSITY AT ALBANY TEAM, JET PROPULSION LABORATORY, CALIFORNIA INSTITUTE OF TECHNOLOGY COLLABORATION — We report on fabrication and growth optimization of an AlGaN/GaN based tunable hyperspectral detector. III-Nitride based detectors possess the potential to detect a large portion, from UV to IR, of the electromagnetic spectrum. Control over the detection wavelength with applied bias across an AlInGaN heterostructure can provide a compact tunable hyperspectral detector eliminating use of filters and gratings which make current tunable detectors bulky. Challenges involved in the development of the device include controlled deposition and characterization of thin layers of $Al_xGa_{1-x}N$ with Al composition varying from 0% to 100% and back to 0%. Performance of such detector is greatly affected by the thickness and quality of the thin heteroepitaxially grown layers which control the dark current and operating voltage of the device. We will present the effect of growth conditions and heterostructure parameters such as composition and thickness on the device performance.

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