

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Processing Gallium Antimonide and Indium Arsenide for MWIR and LWIR LEDs DENNIS NORTON, MARK BOLEY, Western Illinois University, Department of Physics, THOMAS BOGGESS, University of Iowa, Department of Physics and Astronomy — Novel materials made from the semiconductors gallium antimonide (GaSb) and indium arsenide (InAs) play a vital role in the development of mid-wave infrared (MWIR) and long-wave infrared (LWIR) optoelectronic devices such as light-emitting diodes (LEDs). A significant barrier to achieving high output power from LEDs arises from total internal reflection at the LED-air interface. In order to increase extraction efficiency, an InAs-GaSb LED structure containing angled side walls has been designed to redirect horizontally emitted light to the surface and enhance LED output power. An isotropic etch recipe resulted in angled sidewalls of 53 degrees along with a depth of 9 microns. All samples reported on were characterized using a Leitz Ergolux microscope and an atomic force microscope, where surface, as well as cross sectional, pictures were taken.

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Date submitted: 15 Nov 2006

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