

Magazine

2007

April

Go

Feature

[<< previous article](#)[more articles](#)[next article >>](#)

Links

Research review

Strained M-plane film boosts detector selectivity

A GaN ultraviolet photodetector with a detection bandwidth of just 6 nm has been built by scientists from the Tata Institute of Fundamental Research (TIFR), India, the Polytechnic University of Madrid, Spain, and the Paul Drude Institute for Solid-State Electronics, Germany.

The detector delivers a five-fold improvement in bandwidth over its nearest rival, which features a passive absorbing layer with a higher bandgap. "In addition, our detector's configuration is polarization sensitive," explained Sandip Ghosh from TIFR, "which further reduces the influence of scattered background radiation."

The team's detector could be used for real-time studies of hazardous airborne biological and chemical agents using a laser-induced-fluorescence detection technique. Rapid identification of a range of these chemical species requires simultaneous detection at several specific wavelengths, and consequently a set of photodetectors with very narrow spectral bands.

The narrow-band photodetectors were fabricated by growing 0.4 μm -thick [1100] orientated M-plane GaN films on $\gamma\text{-LiAlO}_2$ (100) substrates by RF plasma-assisted MBE. These films were used to fabricate polarization filters and planar Schottky barrier photodetectors with a 200 μm -diameter active region. Orthogonal alignment of the c-axis of the photodetector and filter produces a system with a peak responsivity of 360 nm and a bandwidth of 6 nm.

The team is now attempting to push the detection band to shorter wavelengths with AlGaIn alloys.

- **Journal reference**

S Ghosh *et al.* 2007 *Appl. Phys. Lett.* **90** 091110.