

# Laser Focus World

## NEWSBREAKS

### Aluminum gallium nitride photodiodes are blind above 275 nm

There is great interest in solar-blind ultraviolet photon detectors, especially in the military, which could use such detectors for tracing missile launches. The best materials for building solar-blind devices are compounds of aluminum gallium nitride (AlGaN). The difficulty with these materials, however, is that while the solar blindness improves with the addition of aluminum, higher aluminum content introduces other problems, such as higher resistance. Researchers at the Center for Quantum Devices in the engineering department at Northwestern University (Evanston, IL) have fabricated AlGaN photodiodes grown on sapphire by low-pressure metal-organic chemical-vapor deposition. The devices exhibit a peak responsivity for  $-5$  V bias of  $0.11$  A/W at  $232$  nm, which corresponds to an internal quantum efficiency greater than 90%. Responsivity at zero bias was  $0.05$  A/W, a quantum efficiency of greater than 40%. The response of the device drops four orders of magnitude at  $275$  nm, just below the solar-blind cutoff of  $280$  nm, and stays low across the near-ultraviolet and visible spectrum. Researchers overcame the high resistance of the aluminum-heavy device by adding a semitransparent nickel/gold layer, which assisted in carrier collection. *Contact Manijeh Razeghi at [razeghi@ece.nwu.edu](mailto:razeghi@ece.nwu.edu).*

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