



Contribution ID: 62

Type: **not specified**

Development of (V)UV-Sensitive GaN Geiger-Mode Photodiodes

Friday, 19 March 2021 12:42 (14 minutes)

We present results from our ongoing development of Geiger-mode GaN-photodiodes. Motivated by the silicon photomultiplier's great success, our objective is to transfer the silicon-photomultiplier concept - a matrix of individually quenched single-photon avalanche diodes - to GaN and AlGaN. These are wide band-gap III-N semiconductors with much better intrinsic (V)UV sensitivity than silicon, making them interesting photon-detector materials, for example, to detect scintillation light from liquid Xe and Ar detectors.

The purity of III-N semiconductor substrates is now sufficiently high to envision single-photon sensitive photodiodes operating in Geiger mode. And indeed, we successfully fabricated GaN photodiodes and could demonstrate their Geiger-mode characteristics and single-photon sensitivity.

This presentation will discuss the electrical and optical characteristics of our GaN structures and their implications for developing a GaN solid-state photomultiplier.

Primary authors: OTTE, Nepomuk (Georgia Institute of Technology); CHO, Minkyu (Georgia Institute of Technology); DETCHPROHM, Theeradetch (Georgia Institute of Technology); DUPUIS, Russell (Georgia Institute of Technology); GAZDA, Eliza (Georgia Institute of Technology); JEONG, Hoon (Georgia Institute of Technology); JI, Mi-Hee (Georgia Institute of Technology); NOODEH-BAKHHTIARY, Marzieh (Georgia Institute of Technology); SHEN, Shyh-Chiang (Georgia Institute of Technology); XU, Zhiyu (Georgia Institute of Technology)

Presenter: OTTE, Nepomuk (Georgia Institute of Technology)

Session Classification: Photodetectors

Track Classification: Photodetectors