Contribution ID: **479** Contribution code: **WEP055**　　　　　Type: **Poster Presentation**

Light-Induced Enhancement of Quantum Efficiency in III-Nitride Photocathodes

Wednesday 13 August 2025 16:00 (2 hours)

" High quantum efficiency (QE) semiconductor photocathodes are essential for generating high average beam current and brightness. One class of semiconductor photocathodes considered for use in photoinjectors for unpolarized and polarized electron beams are III-nitride heterostructures. These materials can exhibit negative electron affinity at the surface, utilizing intrinsic polarization fields to engineer the band structure without the need for additional surface treatments. In this study, we investigate the effects of light exposure on the surface of III-nitride photocathodes and the resulting changes in QE and photoemission, using photoemission electron microscopy (PEEM) for characterization. We demonstrate that exposing a GaN photocathode to a 240 nm wavelength laser at 870 μW for 15 minutes increases the QE by two orders of magnitude, with a maximum QE of 2.34×10^{-4} observed. Although III-nitride photocathodes are known for their robustness, our findings indicate that laser exposure can significantly alter their QE. Our observations reveal the need for a detailed investigation of photo-induced effects on QE in III-Nitride photocathodes."

Please consider my poster for contributed oral presentation

No

Would you like to submit this poster in student poster session on Sunday (August 10th)

Yes

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

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