IPAC
'23

Contribution ID: **799** Contribution code: **TUPA131**   Type: **Poster Presentation**

High voltage DC gun using distributed Bragg reflector super lattice GaAs photocathode for EIC polarized electron sources

Tuesday, 9 May 2023 16:30 (2 hours)

The high-intensity, polarized electron source is a critical component for the electron-ion collider which requires a polarized electron gun with higher voltage and higher bunch charge compared to any existing polarized electron source. At Brookhaven National Laboratory, we have built and successfully conditioned the inverted HVDC photoemission gun up to 350 kV. We report on the performance of GaAs photocathode to generate 70 μA average current and up to 16 nC bunch charge with a long lifetime using a circularly polarized laser at 780 nm wavelength. We discuss the Distributed Bragg Reflector GaAs/GaAsP Super Lattice photocathode performance in the DC gun and the anode bias and voltage impact on the lifetime. The gun also integrated a cathode cooling system for potential application on high-current electron sources. The various novel features are implemented and demonstrated in this polarized HVDC.

Funding Agency

Footnotes

I have read and accept the Privacy Policy Statement

Yes

Primary author: WANG, Erdong (Brookhaven National Laboratory)

Co-authors: DEGEN, Christopher (Brookhaven National Laboratory); SKARITKA, John (Brookhaven National Laboratory); BISWAS, Jyoti (Brookhaven National Laboratory); PANICCIA, Matthew (Brookhaven National Laboratory); RAHMAN, Omer (Brookhaven National Laboratory); INACKER, Patrick (Brookhaven National Laboratory); LAMBIASE, Robert (Brookhaven National Laboratory); RANJBAR, Vahid (Brookhaven National Laboratory); LIU, Wei (Brookhaven National Laboratory)

Presenters: WANG, Erdong (Brookhaven National Laboratory); RANJBAR, Vahid (Brookhaven National Laboratory)

Session Classification: Tuesday Poster Session