Contribution ID: **111** Contribution code: **THP025** Type: **Poster Presentation**

Development of Sodium Potassium Antimonide Photocathodes for Use of Coherent electron Cooling

Thursday 14 August 2025 16:00 (2 hours)

The Coherent Electron Cooling (CeC) technique is a breakthrough in accelerator science, enhancing ion beam brightness in facilities like the Electron-Ion Collider (EIC). *The success of CeC relies on high-performance photocathodes (PCs) for photoinjectors, where ideal PCs exhibit high QE, low emittance, long lifetimes, and minimal dark current. Alkali antimonide PCs meet these requirements. Among these, Na-K-Sb shows enhanced robustness, particularly under high-temperature conditions from high-power laser illumination, which generates high current electron beams. It also demonstrates improved vacuum stability and long-term QE consistency compared to other alkali antimonides like K2CsSb and Cs3Sb. These attributes make Na-K-Sb an effective choice for applications requiring both thermal and vacuum stability. This work presents the growth of Na-K-Sb PCs using the CeC cathode deposition system**, alongside detailed QE measurements and spatially resolved QE maps. These findings highlight the potential of Na-K-Sb PCs to advance CeC performance significantly and foster the development of high current, high-brightness electron sources for broader applications

Please consider my poster for contributed oral presentation

Yes

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

No

Footnotes

- V.N. Litvinenko, and Y.S. Derbenev, Coherent electron cooling, Physical Review Letters, 102(11), 114801 (2009). ** K.P. Mondal, R. Begay, J. Biswas, L. Cultrera, M. Gaowei and J. Walsh "An upgrade for the CeC cathode deposition system: co-deposition of K_2CsSb and CsTe/GaAs for CeC use", in Proc. IPAC'24, Nashville, TN, May 2024, pp.2057-2060 (2024).

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I have read and accept the Privacy Policy Statement

Yes

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