

Abstract Submitted
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Development of high performance bi-alkali photocathodes for next-generation sensors JUNQI XIE, KAREN BYRUM, MARCEL DEMARTEAU, ROBERT WAGNER, DEAN WALTERS, JINGBO WANG, LEI XIA, HUYUE ZHAO, Argonne National Laboratory — Next generation sensors such as microchannel plate based photomultiplier tubes call for robust, low-cost photocathodes with high quantum efficiency and low dark current. Traditional alkali photocathodes grown through a diffusion growth process encounter material challenge and are being investigated using X-ray scattering to optimize their performance. Photocathodes with peak quantum efficiency over 30% at ~ 400 nm wavelength were grown via a newly proposed growth method. A new photocathode growth chamber was built and incorporated into the Argonne photodetector fabrication facility to obtain robust, highly efficient bi-alkali photocathodes. The progress on the photocathode study, growth design and experimental results will be reported and discussed.

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