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Design, Production and Testing of Cost-Effective, Large-Area, MCP-based Planar Photodetectors[1] JUNQI XIE, KAREN BYRUM, MARCEL DEMARTEAU, JOHN NOONAN, SAGAR SETRU, MATHEW VIRGO, ROBERT WAGNER, DEAN WALTERS, XING WANG, LEI XIA, HUYUE ZHAO, Argonne Natl Lab, LAPPD COLLABORATION — Microchannel plate (MCP)-based photodetectors with large-area, thin planar geometry and glass-body assembly, are considered as next generation photodetector to replace photomultiplier tubes. They have shown significant potential for applications in high energy collider physics and astrophysics. Due to the extreme sensitivity of the photocathode to water and oxygen, the production of this kind of photodetectors requires photocathodes to be transferred under high vacuum. A new photodetector production facility at Argonne National Laboratory was designed and constructed. The facility aims to produce small form-factor, MCP-based photodetectors completely made out of glass. 6 x 6 cm^2 photodetectors using metal and alkali antimonide as photocathode are currently under production. An overview of the production sequence and first performance results will be presented. Scaling up the production to larger form-factor devices will be discussed. The challenge of sealing a large area photodetector has recently been overcome. Windows with 20x20cm^2 active photocathode area were successfully sealed and progress towards large-area photodetector production progress will be reported.

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[X] Prefer Oral Session
[ ] Prefer Poster Session

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