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## Pilot Production of Large Area Picosecond Photodetectors (12' + 3')

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We report pilot production results achieved for Large Area Picosecond Photodetectors (LAPPD™). The LAPPD™ is a microchannel plate (MCP) based photodetector, capable of imaging with single-photon sensitivity at high spatial and temporal resolutions in a hermetic package with an active area of 400 square centimeters. In December 2015, Incom Inc. completed installation of equipment and facilities for demonstration of early stage pilot production of LAPPD™. Initial fabrication trials commenced in January 2016. The “baseline” LAPPD™ employs an all-glass hermetic package with top and bottom plates and sidewalls made of borosilicate float glass. Signals are generated by a bi-alkali Na<sub>2</sub>K<sub>2</sub>Sb photocathode, amplified with a stacked chevron pair of “next generation” MCPs produced by applying resistive and emissive atomic layer deposition coatings to borosilicate glass capillary array (GCA) substrates. Signals are collected on RF strip-line anodes applied to the bottom plates which exit the detector via pin-free hermetic seals under the side walls. Prior tests show that LAPPDTMs have electron gains greater than 107, sub-millimeter space resolution for large pulses and several mm for single photons, time resolutions of 50 picoseconds for single photons, predicted resolution of less than 5 picoseconds for large pulses, high stability versus charge extraction, and good uniformity. LAPPD™ performance results for product produced during the first half of 2016 will be reviewed. In addition, recent advances in the development of LAPPD™ will also be reviewed as the baseline design is adapted to meet the requirements for a wide range of emerging application including DOE-supported R&D for the Deep Underground Neutrino Experiment (DUNE), nuclear physics applications such as EIC, medical, homeland security and astronomical applications for direct and indirect photon detection.

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