Contribution ID: **462** Type: **Talk**

Performance of Large Area Picosecond Photo-Detectors –LAPPD

Friday, 22 February 2019 15:15 (20 minutes)

The Large Area Picosecond Photo-Detector (LAPPD™) is a microchannel plate (MCP) based planar geometry photodetector featuring single-photon sensitivity, semitransparent bi-alkali photocathode, millimeter spatial and picosecond temporal resolutions and an active area of to 350 square centimeters. The "baseline"LAPPD™ employs a borosilicate float glass hermetic package. Photoelectrons are amplified with a stacked chevron pair of "next generation"large area MCPs produced by applying resistive and emissive Atomic Layer Deposition (ALD) coatings to glass capillary array (GCA) substrates. Signals are collected on microstrip anodes applied to the bottom plate. We report performance results achieved for fully functional sealed LAPPDs™. These results include electron gains of up to 1E7, low dark noise rates (15-30 Hz/cm2), single photoelectron (PE) timing resolution of 64 picoseconds RMS (electronics limited), and single photoelectron spatial resolution along and across strips of 2.4 mm and 0.8 mm RMS respectively and high (up to 25%) QE uniform bi-alkali photocathodes.

While not fully optimized, these tiles are usable for applications by early adopters. Optimized LAPPDs can be employed in neutrino experiments (e.g. ANNIE, WATCHMAN, DUNE), particle collider experiments (e.g. EIC), neutrinoless double-beta decay experiments (e.g. THEIA), medical and nuclear non-proliferation applications. We will also discuss future prospects of the project and new developments in LAPPDs.

Authors: Dr LYASHENKO, Alexey (Incom Inc.); Dr ADAMS, Bernhard (Incom Inc.); Mr AVILES, Melvin (Incom Inc.); Dr ERTLEY, Camden (Incom Inc.); Mr FOLEY, Michael (Incom Inc.); Mr HAMEL, Cole (Incom Inc.); Dr MINOT, Michael (Incom Inc.); Dr POPECKI, Mark (Incom Inc.); Mr STOCHAJ, Michael (Incom Inc.); Dr WORSTELL, William (Incom Inc.); Dr ELAM, Jeffrey (Argonne National Laboratory, Lemont, IL, USA); MANE, anil; SIEGMUND, Oswald (University of California, Berkeley); FRISCH, henry (university of Chicago); ELAGIN, Andrey (University of Chicago)

Presenter: Dr LYASHENKO, Alexey (Incom Inc.)

Session Classification: Plenary 5