Contribution ID: **51**   Type: **Poster Presentation**

Design of a Data Acquisition System for Large Area, Picosecond-Level Photodetectors

This paper presents the Data Acquisition (DAQ) System designed for Large Area, Picosecond-Level Photodetectors. The measurements of time and position, as well as charge and amplitude, are performed using PSEC3, a custom 4-channel, 17-GSPS, Fast Sampling ASIC, designed at The University of Chicago. The prototype detector incorporates six Micro-Channel Plate Photomultipliers (MCP-PMT), placed in two rows of three, like tiles in a tray. The DAQ comprises three different modules. One Analog Card (AC), designed with 10 PSEC3 chips, is placed at each end of a row, and services 40 analog signals from the MCPs. Each Analog Card interfaces with two, small Digital Cards (DC), placed right behind it, each attached with a matched impedance connector. A Digital Card communicates with 5 ASICs, generates a local trigger pulse, and reads the acquired data in parallel. After local processing and reduction, data are ready to be passed along to the Tray Master Card (TMC). The TMC controls a full Tray of 4 ACs and 8 DCs. It sends a low-jitter system clock to all cards in the Tray, it receives data from all DCs, and sends data out, via a Gigabit interconnect, for further processing and storage. Multiple tray systems are also possible. The full design and preliminary test results will be described.

Author: Mr BOGDAN, Mircea (The University of Chicago)

Co-authors: Dr MAY, Edward (Argonne National Laboratory); Mr OBERLA, Eric (The University of Chicago); Prof. VARNER, Gary (The University of Hawaii); Mr GRABAS, Harve (The University of Chicago); Prof. FRISCH, Henry (The University of Chicago); Mr GENAT, Jean-Francois (The University of Chicago); Dr NISHIMURA, Kurtis (The University of Hawaii); Mr NORTHROP, Richard (The University of Chicago)

Presenter: Mr BOGDAN, Mircea (The University of Chicago)

Track Classification: Trigger and Data Acquisition Systems