



Contribution ID: 411

Type: **Poster Presentation**

Development of imaging MCP detector readout electronics, using the NINO and HPTDC ASICs

The requirements of high energy, high luminosity particle accelerators, particularly the Large Hadron Collider at CERN, has driven the development of a range of Application Specific Integrated Circuits (ASICs) able to cope with extremely high event rates and data throughput, while maintaining picosecond timing resolution in the region of 10-100 ps incorporated in a high channel density design. The University of Leicester and Photek Ltd. have been collaborating on using two of these CERN developed ASICs, the NINO amplifier/discriminator and High Performance Time to Digital Convertor (HPTDC), for readout of multi-channel and imaging MCP detectors, taking advantage of the ~ 25 ps resolution of these ASICS combined.

These ASICs are being used for the development of three different microchannel plate (MCP) based imaging detectors. The HiContent and IR-PICS tubes are multiple-anode detectors, with 8×8 pixels² and 32×32 pixels² respectively, with integrated readout electronics based on the HPTDC and NINO combination. The Capacitive Division Image Readout (C-DIR) detector adopts a charge sharing technique to achieve a moderate position resolution of the order of 100×100 pixels² with a time resolution of ~ 25 ps, and a maximum rate of 10MHz limited by MCP count rate saturation. Measurements of the detector's performance will be presented, with a discussion of our experience utilising ASICs designed for high energy physics for alternative applications.

Authors: Dr LAPINGTON, Jon (University of Leicester); Mr CONNEELY, Thomas (University of Leicester)

Co-author: Dr MILNES, James (Photek LTD)

Presenter: Mr CONNEELY, Thomas (University of Leicester)

Track Classification: Photon Detectors