

A square, Mutl-anode MCP-PMT using 6 micrometer pore MCPs for single photon counting

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New developments have allowed, for the first time, use of 6 μm pore MCPs in $53 \times 53 \text{ mm}^2$ active area MCP-PMTs, enabling improved magnetic field immunity and timing performance for single photon detection applications. The performance of Photek MAPMT253 MA-MCP-PMTs using ALD coated versions of these new MCPs will be assessed and compared with the standard 15 μm pore MCPs operating with single photon counting gain ($> 10^6$). Additionally, first results of an MA-MCP-PMT readout by the TOFPET2 ASIC will be presented. The TOFPET2 ASIC offers improved charge measurement linearity in time-over-threshold mode, allowing simpler amplitude walk calibration for timing performance and the possibility of utilising the charge measurement for improving the spatial resolution of multi-anode detectors beyond the pitch of the detector. Results of both time walk correction and sub-pixel resolution capabilities will be discussed

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