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10.16 Further Studies of the Analogue Saturation Limit of MCP-PMTS

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Photek are a well-established supplier of microchannel plate (MCP) photomultiplier tubes (PMT) to the inertial confinement fusion community, and have several detectors installed at NIF, Omega (LLE Rochester) and Orion (AWE). The MCP-PMTs produced by Photek have the shortest response time recorded by devices of this type with a small area single MCP PMT having a FWHM of < 100 ps, and in recent years we have also made significant improvements to their gating ability. The analogue signals produced at the major ICF facilities cover many orders of magnitude and often need multiple detectors operating at different levels of electron gain. As such, understanding the upper saturation limit of MCP-PMTs to large, low rate signals takes on a high importance. A previous study looked at the saturation limit of double and single MCP-PMTs over their full working area with pulse widths between 4 ns and 100 ns. This follow-on analysis will look at the effect of how the illuminated area affects the saturation limit, and how the saturation behaves from pulse widths from 4 ns down to the PMT limit of ~ 100 ps.

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