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## 2.11 Presenting the characterisation of a Pulse Dilation Photo Multiplier Tube intended for use with a gamma-ray sensitive Gas Cherenkov Detector at NIF

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A pulse dilation photo-multiplier tube (PD-PMT) is a newly developed capability, which improves on the temporal resolution of conventional PMTs by approximately an order of magnitude. The corresponding gains in detail of inertial confinement fusion burn histories (10's of picoseconds wide in experiments in the National Ignition Facility), could be used to distinguish overlapping burn histories of different reactants. A PD-PMT uses a decreasing voltage ramp to apply a time varying e-field acceleration to electrons generated by a photocathode to stretch the signal in time (dilate). As earlier electrons are accelerated more than later electrons, the signal is dilated to improve resolution in a short (~ns) time window. A production PD-PMT was characterised at the Orion laser using the Optical Pulse Generator of the short pulse lasers. The PD-PMT was tested by varying operating parameters, input laser pulses, separations of a laser input pulses, and the position of the input laser pulses relative to the start of the ramped voltage (dilation window scan). As well varying the input intensity to quantify the linearity, and translating an apertured beam across the photocathode to assess the spatial uniformity. This poster will outline the characterised performance of the PD-PMT.

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