

ELECTRONIC MEASUREMENT OF MICROCHANNEL PLATE PULSE HEIGHT DISTRIBUTIONS

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Microchannel plates are a central component to the x-ray framing cameras used in many plasma experiment diagnostic systems. The microchannel plate serves as an amplifying element, increasing the electronic signal from incident radiation by a factor of 10^3 - 10^5 , with a broad pulse-height distribution. Seeking to optimize the photon-to-electron conversion efficiency and noise distribution of x-ray cameras, we will characterize the pulse-height distribution of the electron output from a single microchannel plate. Replacing the framing camera's phosphor-coated fiber optic screen with a charge-collection plate and coupling to a low-noise multichannel analyzer, we will quantify the total charge generated per photon event over a range of x-ray energies and incident fluxes. The electronically-measured pulse height distribution will be compared to the same data collected via a purely-optical method, as described previously¹

1. E. C. Harding and R. P. Drake, Rev. Sci. Instrum. 77, 10E312 (2006)

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