

Electronic Measurement of Microchannel Plate Pulse Height Distributions

E. J. Gamboa, E. C. Harding, C. M. Huntington, R. P. Drake

University of Michigan, Ann Arbor, MI 48109 eliseo@umich.edu

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 previously[1].

References

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