

A DEMONSTRATION OF ULTRA-HIGH TIME RESOLUTION WITH A PULSED DILATION PHOTO-MULTIPLIER

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A novel MCP intensified high-speed photo-multiplier tube making use of pulsed dilation[1] has been tested. A ramped photo-cathode voltage followed by a relatively long drift region results in a transit time which is dependent on the photo-electron birth time. This leads to temporal magnification or dilation, so providing an enhancement in time resolution of the optical signal with respect to the electrical signal at the output anode. By this means a time resolution on the order of picoseconds may be realized with a substantially slower oscilloscope. The photo-electron signal is guided from a photo-cathode to an MCP by an axial magnetic field and a short input record length is stretched by a factor up to 40x to yield significantly improved time resolution at the photo-cathode. Results of the first measurements are presented.

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[1] R. D. Prosser, J. Phys. E **9** (57) 1976