Abstract Submitted
for the 4CF14 Meeting of
The American Physical Society

Transit Time Uniformity of Two Commercial 5" Photomultiplier Tubes JOHN PETERSON, TAYLOR W. RICHARDS, NIRDOSH CHAPAGAIN, MICHAEL WARE, JOHN E. ELLSWORTH, JUSTIN PEATROSS, J. BART CZIRR, LAWRENCE B. REES, Brigham Young University Dept. of Physics and Astronomy, BYU NUCLEAR PHYSICS TEAM — We investigated the uniformity of electron transit times across the full spatial extent of two 5" photomultiplier tubes, the Hamamatsu R1250 and the Adit B133D01. The Hamamatsu tube is optimized for its timing characteristics, whereas the Adit tube is optimized for light collection efficiency. The photomultiplier tubes were mounted on a scanning stage so that an attenuated laser pulse could be directed to a localized region of the photocathode. A portion of the incident beam was simultaneously measured and recorded by a fast photodiode. Constant fraction discrimination was utilized to calculate electron transit times as the difference between the start times of the photodiode and photomultiplier traces. The Hamamatsu tube provided a uniform timing response that varied by no more than 1.7 ns. The Adit tube was extremely non-uniform; transit times varied by as much as 57 ns when analyzed with both high and low attenuation levels. The symmetry of the variation in transit times of the Adit tube differed significantly when different constant fraction discrimination parameters were applied.

John Peterson
Brigham Young University

Date submitted: 12 Sep 2014 Electronic form version 1.4