Abstract Submitted
for the APR14 Meeting of
The American Physical Society

Improved Detection of Cherenkov Radiation using Wavelength-Shifting Paints[1] BARAK SCHMOOKLER, LONGWU OU, Massachusetts Institute of Technology — Photomultiplier Tubes (PMTs) are often used to detect Cherenkov radiation in accelerator-based physics experiments. Since the Cherenkov spectrum is inversely proportional to the square of the photon's wavelength, PMTs with relatively good quantum efficiencies in the ultraviolet region can produce on average a higher number of photoelectrons. The application of certain paints, which absorb light at ultraviolet wavelengths and emit in the visible spectrum, to the surface of some PMTs allows for better sampling of the Cherenkov spectrum. The effects of various wavelength-shifting (WLS) paints designed by *Eljen Technologies* were tested on *ET Enterprises, Model: 9390KB* PMTs. Using a ^{106}Ru β-source, Cherenkov light was produced in disks of fused silica. The charge spectrums of the PMTs were measured before and after application of the paint. The average number of photoelectrons produced from the Cherenkov radiation could be determined by knowing the value of the single-photoelectron peak and the mean of the charge spectrum. Four paints were tested, and the gain in the number photoelectrons produced varied from 10-35% for the different paints.

[1]Work Conducted at Thomas Jefferson National Accelerator Facility

Barak Schmookler
Massachusetts Institute of Technology

Date submitted: 07 Jan 2014 Electronic form version 1.4