Abstract Submitted
for the MAS16 Meeting of
The American Physical Society

Detection of far ultraviolet radiation by wavelength-shifting tetraphenyl butadiene CHANDRA B. SHAHI, JOSHUA R. GRAYBILL, University of Maryland , ROBERT E. VEST, National Institute of Standards and Technology , MICHAEL A. COPLAN, University of Maryland, ALAN K. THOMPSON, National Institute of Standards and Technology, CHARLES W. CLARK, Joint Quantum Institute, National Institute of Standards and Technology and University of Maryland — Far ultraviolet radiation (FUV) is used by a number of detectors employed in low-energy particle physics,[1] dark matter searches[2] and neutron dosimetry.[3] Particularly difficult to detect due to its strong absorption by most materials, FUV can be converted to visible light by use of wavelength-shifting scintillators. Tetraphenyl butadiene (TPB) is a widely-used wavelength shifting compound that fluoresces at wavelengths $\lambda \approx 420$ nm when excited by FUV. We have used two methods to coat glass disks with thin films of TPB: direct vapor-phase deposition; and spin-coating of TPB suspended in polystyrene/toluene solutions. Using the NIST SURF III Synchrotron Ultraviolet Radiation Facility,[4] we have measured the absolute fluorescence efficiency of TPB in the range $120\,\text{nm} < \lambda < 400\,\text{nm}$. Our results are compared with previous studies using FUV discharge sources .[5]

[1]V. Chepel and H. Araújo, J. Inst. **8**, R04001 (2013).
[2]E. Aprile, *et al.*, Astroparticle Phys. **35**, 573 (2012).
[3]J. C. McComb, *et al.*, J. Appl. Phys. **115**, 144504 (2014).
[4]see `http://j.mp/surf111` and `http://j.mp/N3utr0n`
[5]V. M. Gehman, *et al.*, Nuc. Instr. Meth. Phys. Res. A **654**, 116 (2011).

Charles Clark
Joint Quantum Institute

Date submitted: 16 Sep 2016 Electronic form version 1.4