

Abstract Submitted
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Detection of far ultraviolet radiation by wavelength-shifting tetraphenyl butadiene JOSHUA R. GRAYBILL, CHANDRA B. SHAHI, MICHAEL C. COPLAN, University of Maryland, ROBERT E. VEST, ALAN K. THOMPSON, National Institute of Standards and Technology, CHARLES W. CLARK, Joint Quantum Institute — Far ultraviolet (FUV) radiation has been used in low-energy particle physics¹, dark matter searches², and neutron detection³, in conjunction with wavelength-shifting (WLS) materials. Tetraphenyl butadiene (TPB) has been found to have high conversion efficiency compared to other WLS fluorophores. We have spin-coated TPB films with high uniformity and optical quality on glass windows and compared the absolute efficiencies of both the spin-coated and vapor deposited films over the incident radiation wavelengths $120 \text{ nm} < \lambda < 400 \text{ nm}$ at the NIST SURF III Synchrotron Ultraviolet Radiation Facility. While photon efficiencies of 0.7 and 1.35, have been reported⁴, our preliminary results indicate the absolute efficiencies to be between 0.2 and 0.5. The Neutron Observatory⁵ was used to compare conversion efficiencies in well-characterized detector platforms.

¹V. Chepel and H. Araújo, *J. Inst.* **8**, R04001 (2013).

²E. Aprile, *et al.*, *Astroparticle Phys.* **35**, 573 (2012).

³J. C. McComb, *et al.*, *J. Appl. Phys.* **115**, 144504 (2014).

⁴V. M. Gehman, *et al.*, *Nuc. Instr. Meth. Phys. Res. A* **654**, 116 (2011).

⁵<http://j.mp/N3utr0n>

Chandra Shahi
UMD

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