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Dependence of polytetrafluoroethylene reflectance on thickness at visible and ultraviolet wavelengths in air JONATHAN HAEFNER, Harvard University, NEXT COLLABORATION — Polytetrafluoroethylene (PTFE) is an excellent diffuse reflector widely used in light collection systems for particle physics experiments. The NEXT experiment uses PTFE inside the TPC to provide highly reflective surfaces to increase the light collection. We describe recent investigations of the dependence of PTFE reflectance on thickness in air for light of wavelengths 260 nm and 450 nm using two complementary methods. We find that PTFE reflectance for thicknesses from 5 mm to 10 mm ranges from 92.5% to 94.5% at 450 nm, and from 90.0% to 92.0% at 260 nm. Finally, we show that placing a specular reflector behind the PTFE can recover the loss of reflectance in the visible without introducing a specular component in the reflectance. These results are guiding the design choices for the NEXT-100 detector.

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