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Measurement of PTFE Reflectance for Xenon Scintillation Light

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The LUX-ZEPLIN (LZ) experiment is a next-generation direct detection experiment under construction to search for dark matter. The detector contains a dual-phase liquid xenon (LXe) time projection chamber with a total active mass of 7 tons and is located at the Sanford Underground Research Facility (SURF) in South Dakota. LZ takes advantage of the high VUV reflectivity of PTFE to achieve high light collection efficiency. Previous work has shown that thinner PTFE layers may reduce radiological backgrounds, and thus these are preferred so long as no significant loss in reflectance results. In this presentation, experimental results of the reflectance near wavelengths of 178 nm of thin PTFE, Kapton, and PEEK sheets immersed in LXe, conducted with the Michigan Xenon Detector (MiX), will be discussed. It is further planned to compare those measurements with light propagation simulations to estimate the absolute reflectance of these materials.

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