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P3.049 Measurement of the fluorescence quantum yield of bis-MSB

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The fluorescence quantum yield of bis-MSB, a widely used liquid scintillator wavelength shifter, was measured to study the photon absorption and re-emission processes in liquid scintillator. The re-emission process affects the photoelectron yield and distribution. It also affects the photoelectron contribution of the Cerenkov light, and thus introduces energy non-linearity to the detector. These effects are especially strong in a large liquid scintillator detector, and thus must be understood to optimize the liquid scintillator for good energy resolution and to precisely simulate the detector with Monte Carlo. In this study, solutions of different bis-MSB concentration were prepared for absorption and fluorescence emission measurements to cover a broad range of wavelengths. Harmane was used as a standard reference to obtain the absolute fluorescence quantum yield. This poster will describe the design and analysis of the measurement of the fluorescence quantum yield of bisMSB up to 430 nm over which the re-emission is significant.