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Development of an Isotropic Optical Light Source for Testing Nuclear Instruments[1] ZACHARY YOKLEY, Virginia Tech, THE LENS COLLABORATION — Nuclear instruments that employ optical components and that require precise characterization and calibration of these components need well characterized optical light sources with the desired wavelength, intensity, and known emission spectrum. One technique is to use the emission from an incoherent light source such as an LED. This talk will present work on a novel technique for determining integral performance (though not timing) by producing an effective isotropic source from an LED. The technique utilizes servo motors to position an LED in a variety of directions. Next, a weighted average of the detector responses is performed, where the weights for each direction are proportional to the value of the probability density functions for the polar and azimuthal angle of an isotropic source. The theory of operation for this technique, results of Monte Carlo simulation validation studies, as well as experimental results for application to the LENS detector design will be presented.

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