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Determining the Shape of Glowing Objects: Applications to Supernovae[1] ZAKARY NOEL, SUZANNE WHEELER, GABRIANNA ESCAMILLA, DANIEL DOVE, CRISTIAN BAHRIM, Department of Physics, Lamar University — Our experiment aims to provide a methodology for determining the shape of a glowing object using polarimetric measurements. We propose a simple, but reliable, tabletop setup, which includes a polarizer/analyzer pair for light analysis located between a black-body emitter and a light sensor. Polygon shaped apertures are mounted in front of a glowing cavity in order to choose a probe signal which characterizes the shape of a glowing object. We have determined that a comparison between the experimental ratios of normalized probe signals to control (circular) signals based on area coverage of the polygon can lead to the identification of the aperture's shape. The overall perceived intensity of the detected light depends on the sensitivity of the photo-detector; therefore, we plan to improve our well calibrated system by using filters in order to eliminate wavelengths of light that lie on the outskirts of the detection range for our light sensor. In addition, we discuss the merits of performing the experiment in a gaseous environment that simulates the atmospheric conditions present on Earth, such as our nitrogen-rich environment.

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