

Abstract Submitted  
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**Finding the shape of a supernova's core**<sup>1</sup> KEELEY TOWNLEY-SMITH, MARK WORTH, CRISTIAN BAHRIM, Department of Physics, Lamar University — Astronomical measurements indicate that a core collapse supernova has an asymmetric core. The light emitted by the core of a supernova can be polarized by the gaseous cloud which is detaching. The analysis of the polarized light can indicate the asymmetry of the core after the explosion of the supernova [ Leonard, D.C. et al. 2006 Nature 440(March 23): 505-507 ]. In our paper we look for assessing the degree of polarization of a glowing object in order to spatially resolve its shape based on the changes in the polarization of light emitted. We design a simple table top setup which uses a glowing object, two polarizers, lenses, a motion sensor and a light sensor to assess the shape of an opening placed in front of the glowing object. We choose a circular opening as our control signal. A rotary motion sensor tracks the rotation of a second polarizer and a light sensor records the variation of light intensity. The probe signal is always a cosine squared function, according to Malus's law, but has variable amplitude. We compare the change in amplitude of different shapes with our control signal in order to determine the eccentricity of the object using a numerical procedure. The equipment can be connected to a telescope in order to spatially resolve the shape of remote objects only by using optical analysis (i.e. metallurgy).

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