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Polarimetry of the Massive Eclipsing Binary Star V356 Sagittarii¹ MIKE MALATESTA, JENNIFER HOFFMAN, JAMIE LOMAX, Uni-

versity of Denver — A supernova is the explosion of a massive star. Some supernovae are characterized by unique, non-spherical, ionized gas clouds that were expelled by the progenitor star before it exploded. In a binary system the process of forming the gas clouds and the supernova becomes more complex. In these binary systems, matter can be transferred from one star to another, creating a mass stream and a disk-like gas cloud surrounding the receiving star. Because most stars occur in binary systems, it is important that we understand the effects of this mass transfer on the subsequent stellar ejection and explosions. Using a process called polarimetry, I study the effects that circumstellar material has on passing light. Through polarimetry we can determine the chemical make-up of gas clouds, describe their shapes and densities, and detect other features such as jets that may affect the behavior of the eventual supernova. I have compiled four years of data on the massive eclipsing binary star V356 Sagittarii, which is a likely supernova progenitor. The polarimetric variations we observe as the stars orbit each other yield detailed information about the circumstellar environment of the two stars and allow us to predict the properties of the future supernova explosion.

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