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Supernova 2009nr: A Normal Supernova in the Optical & Infrared JONATHAN HEATH, GINGER BRYNGELSON, Francis Marion University — A type Ia supernova (SN Ia) is a white dwarf (WD) [a dense, electron-degenerate vestige of a star] that has appropriated enough mass from a neighboring star that the total mass of the WD reaches a critical point. The star quickly approaches its mass limit (Chandrasekhar limit) until the overall heat and pressure results in a thermonuclear explosion. A plot of this object's brightness over time is known as a light curve. Because of the uniformity of their light curves, SNe Ia are valuable markers for determining the expansion of the universe and other cosmological parameters. Understanding the properties of these supernovae is vital in order to build our confidence in their use as standard candles. A small, but increasing number of SN Ia late-time observations have been made in the near-infrared (NIR). Most exhibit a flattening of the NIR power even as the visible light declines at a steady rate. It is still unclear as to why they exhibit this behavior and how typical this is. In order to characterize the late behavior of SNe Ia, images of the supernova 2009nr were analyzed using the Image Reduction and Analysis Facility (IRAF). NIR (J, H, K) images were taken with the 4m Mayall Telescope at Kitt Peak National-Observatory using the FLAMINGOS IR Imaging Spectrometer while optical (B, V, R, I) images used the Mosaic 1 imager. The supernova's apparent magnitude for each night of observation (by filter) was found by using reference stars. We present preliminary light curves of the supernova 2009nr and a comparison to another SN Ia observed at similar epochs.

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