

SN 2022ACKO and SN progenitor Star properties: Detection, Light Curves and late phases analysis

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Red supergiants (RSGs) stars are a stage of the life cycle of a massive star, with mass greater than 8 times the mass of the Sun. At the end of their lives, these stars either explode as supernovae or collapse directly into black holes. Having an efficient alert system allows us to infer the fundamental properties of the supernova progenitor star, that are contained mostly in the early phases of the explosion. In this contribution, we present an analysis of infrared, optical, and ultraviolet data from the hydrogen-rich supernova 2022acko. We will discuss possible disagreements between the shock cooling modeling and the observed data for earlier phases. From the late phases data, we will discuss the radius and temperature evolution of the shock, and also an analysis on the nickel mass of the SN progenitor star. The follow-up data and pre-explosion imaging support that 2022acko was the explosion of a low-mass red supergiant star. Combining these data, we constrain the formation of a neutron star in the explosion of this event.

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