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SN2024uwq and the Evolutionary History of Type IIb Supernovae

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Yellow Supergiants have been observed exploding as Type IIb Supernovae (SNe), which is not predicted by standard single-star evolution models. The evolutionary history of these progenitors is still highly debated, however, there is tentative evidence for two Type IIb progenitor classifications – those with compact versus extended radii – which have different mass-loss histories. Early optical data, which constrains the progenitor's mass and radius, can be complemented with radio light curve data that probes the circumstellar medium (CSM) to explore the evolutionary history and properties of these progenitors. Using synchrotron self-absorption models, we perform this analysis on the nearby Type IIb supernova SN2024uwq. Further, we compare SN2024uwq to other Type IIb supernovae with early detection data and binary stellar evolution models to assess population-level trends. We determine that SN2024uwq has a wind-like CSM with a seemingly more compact progenitor, which leads to higher windspeeds in contrast to the rest of our catalogue. Comparing the evolutionary histories of these supernovae, we find that SN2024uwq may indicate that there are intermediate Type IIb Supernovae, or that the proposed extended versus compact classification is a continuum.

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Yes

What is your career level?

Undergraduate

Which keyword describes the area of focus of this talk?

Transients

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