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Understanding the progenitor systems of peculiar 2002es-like and 2003fg-like supernovae with their host galaxies

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The 2002es-like and 2003fg-like supernovae (SNe) are weirdos of SNe Ia. While their progenitor systems and explosion mechanisms are still mysterious, they were believed to have different origins from past observations. However, recent studies on their UV light curves indicated that they are actually very similar in the UV and could share the same origin. This work aims to investigate these peculiar explosions with their host-galaxy environments. We will examine and compare the host-galaxy properties of the 2002es-like and 2003fg-like SNe Ia and look for their environmental differences. Our sample contains the UV-to-IR imaging data of 15 2002es-like and 37 2003fg-like SNe Ia collected from the *GALEX*, *PS1*, *SDSS*, *SkyMapper*, *2MASS*, and *WISE* databases. We extracted the global host-galaxy photometry with the Python package *Hostphot* and measured their host-galaxy properties (such as stellar mass, age, and star-formation rate) with the Python package *Prospector*. We then investigate the relations between the host-galaxy properties and various SN parameters (such as light-curve width and color) and discuss how they can shed the light on the origin of these peculiar SNe.

Section

Galaxy/Extragalactic

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