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Host galaxy influence on Type Ia Supernovae: First insights into the mass step with ZTF DR2

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Type Ia supernovae (SNe Ia) are essential tools for measuring cosmic distances, yet their standardisation remains imperfect. Even after correcting for light-curve properties, residual correlations with host galaxy properties such as mass persist. Correcting for the so-called mass step is crucial for precise measurements in cosmological analysis, and its origin remains poorly understood.

In this work, we present first results of the mass step using a volume-limited sample of SNe Ia from ZTF. Host galaxy properties are obtained from GAMA's spectroscopic measurements. We apply a new regression model based on GAMA galaxies to expand the sample beyond the GAMA footprint to estimate host properties from Legacy Survey fluxes. We also incorporate infrared data from the WISE catalogue to account for dust, which has been proposed as a possible physical origin of the mass step. Using this approach, we present correlations between host-galaxy properties and SNe Ia light-curve parameters. This work aims to better characterise the mass step and serves as a precursor for upcoming surveys like LSST, which will discover millions of SNe Ia.

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