

Comparing the host galaxies of different type supernovae

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Abstract. We compare the host galaxies of 902 supernovae, including Type Ia, II and Ibc, which are selected by cross-matching the Asiago Supernova Catalog with the SDSS DR7. We further selected 213 galaxies by requiring the light fraction of spectral observations $>15\%$, which could represent well the global properties of the galaxies. The diagrams related to $D_n(4000)$, $H\delta_A$, stellar masses, SFRs and specific SFRs for the SNe hosts show that almost all SNe II and most of SNe Ibc occur in SF galaxies. A significant fraction of SNe Ia occurs in AGNs and Absorption galaxies. These results are compared with those of the 689 comparison galaxies where the SDSS fiber captures $<15\%$ of the total light. These comparison galaxies appear biased towards higher $12+\log(O/H)$ (~ 0.1 dex) at a given stellar mass, suggesting the aperture effect should be kept in mind when the properties of the hosts for different types of SNe are discussed.

Keywords. galaxies: evolution, galaxies: star formation, galaxies: starburst

Cross-correlations between ASC (Barbon *et al.* 1999) and SDSS-DR7 MGS (Abazajian *et al.* 2009) using 15 arcsec radius are made to select the supernova host galaxies and we got 902 host galaxies. Among them, 213 host galaxies have light fraction (lf , Liang *et al.* 2010) more than 15%, denoting that their 3 arcsec fiber observation by SDSS cover most light of the whole galaxies. By comparing the relations between $D_n(4000)$, $H\delta_A$, stellar masses, SFRs and specific SFRs, we found that almost all the SNe II and most SNe Ibc occur in star forming (SF) galaxies (having a wide range of stellar mass and low $D_n(4000)$). And only very few are in the AGNs and weak emission-line & Absorption galaxies (massive and have high $D_n(4000)$). The majority of the SNe Ia occur in AGNs and absorption-line galaxies and about one-third in SF galaxies. The K-S test for stellar population analysis shows that the hosts of SNe II are younger than the hosts of type Ia SNe. The hosts of SNe Ia are more metal-rich than hosts of SNe II. When compared to 689 SN host galaxies with $lf < 15\%$, these 213 galaxies appear biased towards lower $12+\log(O/H)$ (~ 0.1 dex) at a given stellar mass, suggesting the aperture effect should be kept in mind when the properties of the hosts for different types of SNe are discussed.

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