The stellar populations of host galaxies of supernovae

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Abstract. We study and compare the stellar populations of host galaxies of different types of supernovae (SNe): SN Ia and core collapse SN (SN II and SN Ibc) at the same time. The 234 sample galaxies are selected by cross-matching the Asiago Supernova Catalogue (ASC) and the SDSS-DR7 main galaxy sample (MGS). The STARLIGHT software is used to analyze their stellar populations by fitting the continua and absorption lines of the hosts.

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

We performed cross-matching on the ASC and the SDSS-DR7 MGS with 30 arcsec radius to select supernova host galaxies. We select galaxies for which the light-fraction (see details in Liang et al. 2010) of their SDSS spectral observations are > 0.15 to ensure that the 3 arcsec fiber can cover most of their global light. In total 234 SN host galaxies are selected, which are divided into two subsamples: emission-line galaxies and absorption-line galaxies. We fit the stellar continua and absorption lines of the hosts using Starlight (Cid Fernandes et al. 2005, Chen et al. 2009). The results are shown in Table 1. Among the 137 emission-line galaxies, the fraction of young stellar populations is higher in hosts of SN II than in hosts of SN Ia and Ibc. Most of the 97 absorption-line galaxies host a SN Ia, and they have a large fraction of old stellar populations. The 137 hosts with emission lines contain much younger stellar populations.

Table 1. The contributed light fraction of stellar populations in age-bins for SN host galaxies.

<table>
<thead>
<tr>
<th>hosts of</th>
<th>emission-line galaxies</th>
<th>absorption-line galaxies</th>
</tr>
</thead>
<tbody>
<tr>
<td>SN Ia</td>
<td>SN II SN Ibc</td>
<td>SN Ia SN II SN Ibc</td>
</tr>
<tr>
<td>Young (&lt;0.2 Gyr)</td>
<td>30.2 56.5 22.2</td>
<td>12.5 26.8 25.8</td>
</tr>
<tr>
<td>Intermediate (0.2-2 Gyr)</td>
<td>42.2 31.5 51.6</td>
<td>28.0 30.1 39.2</td>
</tr>
<tr>
<td>Old (&gt;2 Gyr)</td>
<td>27.6 12.0 26.2</td>
<td>59.5 43.1 35.0</td>
</tr>
</tbody>
</table>

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References