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J/MNRAS/456/2848 Properties of 500 SNe and their 419 hosts (Hakobyan+, 2016)

Supernovae and their host galaxies.

III. The impact of bars and bulges on the radial distribution of supernovae in disc galaxies.

Hakobyan A.A., Karapetyan A.G., Barkhudaryan L.V., Mamon G.A., Kunth D., Petrosian A.R., Adibekyan V., Aramyan L.S., Turatto M.
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ADC_Keywords: Supernovae ; Galaxies, optical ; Galaxy catalogs ;
 Morphology ; Positional data ; Surveys

Keywords: supernovae: general - galaxies: spiral - galaxies: stellar content -
 galaxies: structure

Abstract:

We present an analysis of the impact of bars and bulges on the radial distributions of the different types of supernovae (SNe) in the stellar discs of host galaxies with various morphologies. We use a well-defined sample of 500 nearby (≤ 100 Mpc) SNe and their low-inclined ($i \leq 60^\circ$) and morphologically non-disturbed S0-Sm host galaxies from the Sloan Digital Sky Survey. We find that in Sa-Sm galaxies, all core-collapse (CC) and vast majority of SNe Ia belong to the disc, rather than the bulge component. The radial distribution of SNe Ia in S0-S0/a galaxies is inconsistent with their distribution in Sa-Sm hosts, which is probably due to the contribution of the outer bulge SNe Ia in S0-S0/a galaxies. In Sa-Sbc galaxies, the radial distribution of CC SNe in barred hosts is inconsistent with that in unbarred ones, while the distributions of SNe Ia are not significantly different. At the same time, the radial distributions of both types of SNe in Sc-Sm galaxies are not affected by bars. We propose that the additional mechanism shaping the distributions of Type Ia and CC SNe can be explained within the framework of substantial suppression of massive star formation in the radial range swept by strong bars, particularly in early-type spirals. The radial distribution of CC SNe in unbarred Sa-Sbc galaxies is more centrally peaked and inconsistent with that in unbarred Sc-Sm hosts, while the distribution of SNe Ia in unbarred galaxies is not affected by host morphology. These results can be explained by the distinct distributions of massive stars in the discs of early- and late-type spirals.

Description:

The full database of 500 individual SNe (SN designation, type, and offset from host galaxy nucleus) and their 419 host galaxies (galaxy SDSS designation, distance, morphological type, bar, corrected g-band D_{25} , a/b, PA, and inclination).

File Summary:

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
table.dat	115	500	Properties of 500 SNe and their 419 hosts

See also:

[B/sn](#) : Asiago Supernova Catalogue (Barbon et al., 1999-)
[J/A+A/544/A81](#) : Supernovae and their hosts in SDSS DR8 (Hakobyan+, 2012)
[J/MNRAS/444/2428](#) : Disturbance levels of SNe host galaxies (Hakobyan+, 2014)
<http://www.sdss.org> : SDSS Home Page

Byte-by-byte Description of file: [table.dat](#)

Bytes	Format	Units	Label	Explanations
1- 6	A6	---	SN	Supernova (SN) designation
9- 16	A8	---	Type	SN type (from spectroscopy)
21- 26	F6.2	arcsec	oRA	SN offset right ascension from host galaxy nucleus, in the E/W direction
28	A1	---	n_oRA	[E/W] E/W direction of SN offset oRA
32- 37	F6.2	arcsec	oDE	SN offset declination from host galaxy nucleus, in the N/S direction
39	A1	---	n_oDE	[N/S] N/S direction of SN offset oDE
41- 59	A19	---	Gal	SN host galaxy identification (1).
66- 71	F6.3	Mpc	Dist	Host galaxy distance
74- 77	A4	---	MType	Host galaxy morphological type
81	A1	---	u_MType	[?:] Uncertainty flag on morphology (2).
84	A1	---	Bar	[B] Presence of bar in the host galaxy
87	A1	---	u_Bar	[?:] Uncertainty flag on presence of bar (3).
91- 97	F7.2	arcsec	Diam	Host galaxy diameter (4).
100-104	F5.3	---	a/b	Host galaxy axial ratio
107-109	I3	deg	PA	Host galaxy position angle
112-115	F4.1	deg	Inc	Host galaxy inclination

Note (1): JHHMSS.ss+DDMMSS.s for SDSS JHHMSS.ss+DDMMSS.s

An alternative name is mentioned when SDSS identification was not possible to obtain. Unidentified (anonymous) galaxies are listed with the letter A.

Note (2): Uncertainties in host galaxy morphological type are marked by ":" and "?" (highly uncertain).

Note (3): Uncertainties in host galaxy bar are marked by ":" and "?" (highly uncertain).

Note (4): Corrected major axis in arcsec (isophotal level of 25mag/arcsec² in the SDSS g-band) of the host galaxy.

Acknowledgements:

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References:

Hakobyan et al., Paper I [2012A&A...544A..81H](#), Cat. [J/A+A/544/A81](#)

Hakobyan et al., Paper II [2014MNRAS.444.2428H](#), Cat. [J/MNRAS/444/2428](#)

(End) Artur Hakobyan [BAO], Patricia Vannier [CDS]

26-Feb-2016

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