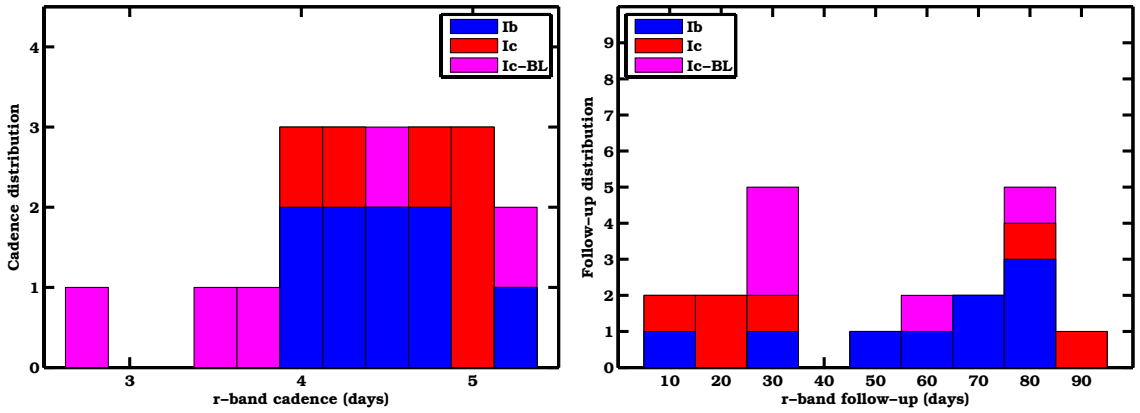


**Fig. 7.** *Lefthand panel*: *r*-band cadence distribution for the SDSS SN Ib/c sample. Typical values are between 4 and 5 days. *Righthand panel*: *r*-band follow-up distribution for the SDSS SN Ib/c sample. SNe were followed for a minimum of ∼10 days to a maximum of ∼90 days after discovery.

**Table 1.** SDSS sample of 20 SNe Ib, Ic and Ic-BL.

| SN | RA (J2000) (hh:mm:ss) | Dec (J2000) (dd:mm:ss) | Type | Redshift | Distance (Mpc) | Host galaxy | $E(B-V)_{\rm MW}$ (mag) | $E(B-V)_{\rm host}{}^{*}$ (mag) | $M_g^{\rm gal}{}^{**}$ (mag) |
|---|---|---|---|---|---|---|---|---|---|
| 2005fk | 21 : 15 : 19.84 | −00 : 22 : 58.6 | Ic-BL | 0.264 | 1341.1 | A211519-0022 | 0.054 | ... | –19.90 |
| 2005hl | 20 : 55 : 19.79 | +00 : 32 : 34.7 | Ib | 0.023 | 100.4 | A205519+0032 | 0.073 | 0.533 | –20.23 |
| 2005hm | 21 : 39 : 00.65 | −01 : 01 : 38.7 | Ib | 0.035 | 151.6 | A213900-0101 | 0.048 | 0 | –15.51 |
| 2005kr | 03 : 08 : 29.66 | +00 : 53 : 20.2 | Ic-BL | 0.134 | 627.1 | A030829+0053 | 0.087 | 0.075 | –17.57 |
| 2005ks | 21 : 37 : 56.56 | −00 : 01 : 56.9 | Ic-BL | 0.099 | 451.5 | A213756-0001 | 0.050 | 0.537 | –19.39 |
| 2005mn | 03 : 49 : 18.44 | −00 : 41 : 31.4 | Ib | 0.047 | 209.2 | A034918-0041 | 0.166 | ... | –18.86 |
| 2006fe | 20 : 52 : 09.10 | −00 : 30 : 39.3 | Ic | 0.070 | 316.3 | SDSS J205209.10-003039.2 | 0.098 | 0.132 | –20.56 |
| 2006fo | 02 : 32 : 38.89 | +00 : 37 : 03.0 | Ib | 0.021 | 89.4 | UGC 2019 | 0.026 | 0.301 | –20.31 |
| 14475 | 22 : 24 : 30.90 | +00 : 12 : 12.3 | Ic-BL | 0.149 | 705.3 | SDSS J222430.86+001212.3 | 0.072 | 0.650 | –18.05 |
| 2006jo | 01 : 23 : 14.72 | −00 : 19 : 46.7 | Ib | 0.077 | 345.8 | A012314-0019 | 0.032 | 0.460 | –20.81 |
| 2006lc | 22 : 44 : 24.48 | −00 : 09 : 53.5 | Ib | 0.016 | 69.7 | NGC7364 | 0.057 | 0.510 | –21.20 |
| 2006nx | 03 : 33 : 30.63 | −00 : 40 : 38.2 | Ic-BL | 0.137 | 641.9 | A033330-0040 | 0.108 | 0.461 | –19.19 |
| 2006qk | 22 : 25 : 32.38 | +00 : 09 : 15.1 | Ic | 0.058 | 259.5 | A222532+0009 | 0.075 | ... | –17.96 |
| 2007gl | 03 : 11 : 33.21 | −00 : 44 : 46.7 | Ib | 0.028 | 122.6 | KUG 0309-009 | 0.059 | ... | –19.51 |
| 2007jy | 20 : 51 : 21.43 | +00 : 23 : 57.8 | Ib | 0.180 | 869.0 | A205121+0023 | 0.095 | ... | –19.86 |
| 2007ms | 20 : 32 : 18.34 | −01 : 00 : 53.1 | Ic | 0.039 | 170.9 | A203218-0100 | 0.184 | 0.040 | –17.76 |
| 2007nc | 00 : 01 : 09.30 | +01 : 04 : 06.5 | Ib | 0.087 | 393.9 | A000109+0104 | 0.025 | 0.227 | –20.21 |
| 2007qv | 22 : 35 : 07.91 | −01 : 06 : 37.5 | Ic | 0.095 | 433.5 | A223507-0106 | 0.048 | 0 | –19.61 |
| 2007qx | 00 : 27 : 41.78 | +01 : 13 : 59.7 | Ic | 0.080 | 363.3 | A002741+0113 | 0.023 | 0.371 | –20.20 |
| 2007sj | 00 : 10 : 39.63 | −00 : 03 : 10.2 | Ic | 0.039 | 170.1 | A001039-0003 | 0.032 | ... | –21.24 |

**Notes.** Typical errors on the distance are on the order of 5−10%. Redshifts are usually known with a precision down to $\delta z \sim 0.001$ (Zheng et al. 2008). (*) See Sect. 3.3.1 for details. (**) The absolute magnitude in $g$ band for each host galaxy is corrected for the Milky Way extinction at the position of the host center and K-corrected.

**Table 2.** Spectral log for the SDSS SNe Ib/c.

| SN | Type | Spectral epoch (MJD-53 000) | Telescope | Velocity (km s$^{-1}$) | SN | Type | Spectral epoch (MJD-53 000) | Telescope | Velocity (km s$^{-1}$) |
|---|---|---|---|---|---|---|---|---|---|
| 2005fk | Ic-BL | 640.10* | HET | 11700 (Si) | 2006lc | Ib | 1030.17 | H | 6080 (Si) |
| 2005hl | Ib | 665.12* | MGH | 5450 (He) | | | 1035.19 | H | 11261 (He) |
| 2005hm | Ib | 663.19* | MGH | 9470 (He) | | | 1043.14* | H | 9050 (He) |
| 2005kr | Ic-BL | 696.19* | HET | 12200 (Si) | | | 1059.13 | H | 8246 (He) |
| 2005ks | Ic-BL | 696.06* | HET | 15500 (Si) | | | 1082.08 | ESO-NTT | 7141 (He) |
| 2005mn | Ib | 705.29* | HET | 11900 (He) | | | 1069.06 | H | |
| | | 708.35 | ARC | | | | 1072.61 | H | |
| | | 711.27 | HET | 11000 (He) | 2006nx | Ic-BL | 1056.19 | NOT | 15400 (Si) |
| | | 767.13 | HET | | | | 1057.33 | KP | |
| | | 767.13 | HET | | | | 1058.36 | H | |
| | | 767.13 | HET | | | | 1063.31* | ESO-NTT | 14190 (Si) |
| 2006fe | Ic | 994.02* | ESO-NTT | 4760 (Si) | | | 1064.32 | ESO-NTT | 13190 (Si) |
| | | 995.26 | SUBARU | 5340 (Si) | 2006qk | Ic | 1065.11* | ESO-NTT | 13740 (He) |
| 2006fo | Ib | 995.16 | ESO-NTT | 10480 (He) | | | 1072.06 | H | |
| | | 1004.40 | KP | 10080 (He) | | | 1073.07 | H | |
| | | 1010.44* | ARC | 9530 (He) | | | 1085.04 | ESO-NTT | |
| | | 1015.38 | H | 9280 (He) | 2007jy | Ib | 1363.09* | ESO-NTT | |
| | | 1018.41 | H | 9380 (He) | 2007ms | Ic | 1361.03 | ESO-NTT | 11410 (He) |
| | | 1024.36 | ESO-NTT | 9030 (He) | | | 1387.05* | ESO-NTT | 7130 (Si) |
| | | 1027.36 | H | 8680 (He) | | | 1389.04 | ESO-NTT | |
| | | 1031.31 | H | 8430 (He) | 2007nc | Ib | 1390.16* | ESO-NTT | 12680 (Si) |
| | | 1037.32 | H | 8030 (He) | 2007qv | Ic | 1413.10* | H | |
| | | 1059.33 | H | | | | 1415.09 | H | |
| | | 1064.27 | ESO-NTT | 7380 (He) | 2007qx | Ic | 1417.18* | ESO-NTT | 11790 (He) |
| 14475 | Ic-BL | 1023.31* | SUBARU | 18700 (Si) | 2007sj | Ic | 1429.13 | H | |
| 2006jo | Ib | 1019.30 | H | | | | 1441.14* | ESO-NTT | |
| | | 1023.26* | ESO-NTT | 14360 (He) | | | | | |

**Notes.** All the spectra were released by Sako et al. (2014). ARC = Astrophysical Research Consortium 3.5 m telescope at the Apache Point Observatory (New Mexico), ESO-NTT = New Technology 3.6 m Telescope in La Silla (Chile), HET = Hobby-Eberly 9.2 m Telescope at McDonald Observatory (Texas), H = Hiltner 2.4 m telescope at the Michigan-Dartmouth-MIT observatory (Arizona), KP = Kitt Peak National Observatory Mayall 4 m telescope (Arizona), MGH = McGraw-Hill 1.3 m telescope at the Michigan-Dartmouth-MIT observatory (Arizona), NOT = Nordic Optical 2.5 m Telescope in La Palma (Spain), SUBARU = 8.2 m Subaru Telescope at the National Astronomical Observatory of Japan (Hawaii). (He): Velocity measured from He I $\lambda$5876. (Si): Velocity measured from Si II $\lambda$6355. $^{(*)}$ Spectra plotted in Fig. 1.

**Table 3.** Parameters from the fit of the SDSS Ib/c SN light curves.

| SN | $A$ ($\mu$Jy) | $\tau_{\rm rise}$ (days) | $\tau_{\rm fall}$ (days) | $t_0$ (MJD) | $C$ ($\mu$Jy) | $t_{\rm max}$ (MJD) | $F_{\rm max}$ ($\mu$Jy) | $\Delta m_{15}$ (mag) | $\Delta m_{-10}$ (mag) | $t_{\rm rise}$ (days) | $t_{\rm expl}$ (MJD) | $m_{\rm max}$ (mag) | $M_{\rm max}$ (mag) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $u$ band | | | | | | | |
| 2005hm | 113.38(11.15) | 2.54(0.48) | 5.61(1.67) | 53 641.53(3.47) | 2.46(1.10) | 53 642.04(2.24) | 59.41(5.21) | 1.98(0.44) | 1.38(0.46) | 14.35(5.98) | | 19.47(0.10) | −16.67 |
| 2006fo | 180.59(27.50) | 2.95(0.17) | 3.88(0.57) | 54 004.40(1.54) | 4.68(0.84) | 54 000.90(0.34) | 108.93(6.81) | 2.26(0.16) | 0.56(0.20) | 15.66(9.43) | | 18.81(0.07) | −17.57 |
| 2006lc | 97.47(6.67) | 1.74(0.16) | 3.75(0.73) | 54 038.61(0.80) | 5.40(1.29) | 54 038.85(0.46) | 54.25(3.16) | 2.21(0.15) | 1.81(0.16) | 23.23(4.14) | | 19.56(0.06) | −17.46 |
| 2007ms | 86.54(16.93) | 3.90(0.84) | 6.90(4.67) | 54 370.38(6.65) | 2.48(1.36) | 54 369.33(3.79) | 46.11(8.56) | 1.33(0.53) | 0.61(0.96) | 17.48(19.19) | | 19.74(0.20) | −17.52 |
| 2007qv | 35.33(7.22) | 0.49(0.33) | 7.41(2.17) | 54 410.25(0.78) | 6.66(3.81) | 54 411.67(0.68) | 34.36(3.43) | 1.28(0.24) | … | 5.89(3.16) | | 20.06(0.11) | −18.36 |
| | | | | | | $g$ band | | | | | | | |
| 2005hl | 145.58(13.52) | 5.29(0.31) | 6.73(0.92) | 53 634.11(1.86) | 17.99(0.58) | 53 627.06(0.62) | 104.64(1.21) | 0.72(0.07) | 0.18(0.05) | … | | 18.85(0.01) | −18.46 |
| 2005hm | 123.94(2.81) | 3.21(0.08) | 8.80(0.63) | 53 643.65(0.67) | 7.71(0.69) | 53 645.49(0.32) | 72.01(0.96) | 1.11(0.05) | 0.94(0.05) | 17.69(1.06) | | 19.26(0.01) | −16.82 |
| 2005kr | 35.52(4.74) | 2.22(0.28) | 13.16(2.01) | 53 681.39(0.74) | 0.00(0.90) | 53 685.41(0.57) | 22.56(1.75) | 1.04(0.15) | 2.19(0.25) | 11.03(1.60) | | 20.52(0.08) | −19.12 |
| 2005ks | 20.30(5.60) | 1.83(0.48) | 14.55(5.94) | 53 680.48(2.11) | 0.00(0.37) | 53 684.38(1.59) | 13.91(2.37) | 0.97(0.36) | 2.97(1.62) | 9.33(3.43) | | 21.04(0.18) | −19.66 |
| 2006fo | 437.58(13.43) | 4.44(0.14) | 8.01(0.29) | 54 004.47(0.87) | 43.17(0.66) | 54 003.49(0.22) | 263.24(4.67) | 0.89(0.02) | 0.43(0.04) | 18.20(9.37) | | 17.85(0.02) | −18.15 |
| 14475 | 11.85(1.89) | 1.38(0.47) | 13.32(2.61) | 54 008.68(0.79) | 0.15(0.31) | 54 012.10(1.07) | 8.64(0.78) | 1.07(0.17) | 3.74(3.04) | 8.15(3.34) | | 21.56(0.10) | −20.80 |
| 2006jo | 49.47(3.46) | 1.85(0.16) | 6.20(0.67) | 54 011.58(0.68) | 2.13(0.41) | 54 013.29(0.35) | 29.03(1.27) | 1.80(0.13) | 2.12(0.26) | 10.16(5.68) | | 20.24(0.05) | −19.44 |
| 2006lc | 338.98(4.58) | 2.62(0.04) | 11.62(0.33) | 54 036.59(0.24) | 0.00(1.17) | 54 039.87(0.15) | 198.77(1.80) | 1.13(0.02) | 1.67(0.05) | 24.23(3.96) | | 18.15(0.01) | −18.20 |
| 2006nx | 26.11(5.65) | 1.40(0.85) | 8.60(1.20) | 54 049.87(1.04) | 4.78(1.85) | 54 052.47(0.82) | 21.52(1.16) | 1.04(0.18) | 1.58(0.18) | 11.94(2.00) | | 20.57(0.06) | −20.87 |
| 2007ms | 144.64(5.63) | 3.76(0.17) | 11.21(0.77) | 54 371.13(0.59) | 7.47(0.89) | 54 373.80(0.34) | 83.87(3.45) | 0.88(0.05) | 0.76(0.06) | 21.78(4.95) | | 19.09(0.04) | −17.91 |
| 2007nc | 18.91(2.52) | 3.75(0.72) | 12.40(4.12) | 54 389.81(4.16) | 0.00(0.66) | 54 393.21(1.91) | 10.24(0.78) | 0.93(0.33) | 0.88(0.37) | 14.59(7.32) | | 21.37(0.08) | −17.63 |
| 2007qv | 32.16(2.34) | 0.61(0.17) | 32.82(4.35) | 54 409.19(0.42) | 0.00(1.59) | 54 411.83(0.64) | 29.33(0.59) | 0.48(0.07) | … | 6.03(3.11) | | 20.23(0.02) | −18.13 |
| 2007qx | 19.69(3.04) | 2.55(0.44) | 14.55(4.29) | 54 415.30(1.13) | 1.25(0.79) | 54 419.57(0.81) | 13.62(0.64) | 0.79(0.22) | 1.39(0.23) | 19.68(5.25) | | 21.06(0.05) | −18.34 |
| | | | | | | $r$ band | | | | | | | |
| 2005fk | 16.54(3.75) | 2.80(0.85) | 7.93(3.92) | 53 627.85(6.55) | 0.63(0.42) | 53 629.99(4.75) | 9.27(1.49) | 1.36(0.71) | 1.25(1.35) | … | … | 21.48(0.17) | −19.30 |
| 2005hl | 334.02(3.34) | 4.65(0.16) | 15.26(0.62) | 53 627.63(0.46) | 47.51(1.37) | 53 631.56(0.17) | 228.14(1.72) | 0.51(0.01) | 0.44(0.03) | … | … | 18.00(0.01) | −18.67 |
| 2005hm | 115.86(3.32) | 3.32(0.12) | 14.04(0.84) | 53 644.66(0.42) | 16.40(1.02) | 53 648.69(0.01) | 83.47(1.68) | 0.64(0.03) | 0.77(0.04) | 20.78(0.96) | 53 627.18(0.99) | 19.10(0.02) | −16.94 |
| 2005kr | 44.83(5.11) | 2.34(0.29) | 25.45(6.34) | 53 681.50(0.87) | 0.00(0.11) | 53 687.58(0.01) | 32.97(1.89) | 0.54(0.11) | 1.76(0.32) | 12.95(1.28) | 53 672.90(1.45) | 20.10(0.06) | −19.35 |
| 2005ks | 33.67(4.81) | 3.58(0.52) | 14.84(7.83) | 53 687.32(3.12) | 0.00(0.52) | 53 691.83(0.01) | 19.38(1.39) | 0.80(0.28) | 0.95(0.39) | 16.11(0.91) | 53 674.12(1.00) | 20.68(0.08) | −19.33 |
| 2005mn | … | … | … | … | … | … | … | … | … | … | 53 691.87(4.53) | … | … |
| 2006fe | 50.78(2.72) | 3.89(1.25) | 18.36(3.42) | 53 979.18(2.89) | 5.17(1.08) | 53 984.65(2.74) | 35.47(5.81) | 0.52(0.06) | 0.63(0.70) | … | … | 20.03(0.18) | −18.12 |
| 2006fo | 592.21(4.20) | 4.77(0.09) | 12.63(0.44) | 54 005.57(0.52) | 107.07(1.75) | 54 008.00(0.01) | 412.24(1.99) | 0.53(0.01) | 0.38(0.01) | 22.62(9.32) | 53 984.92(9.51) | 17.36(0.01) | −18.30 |
| 14475 | 24.49(1.42) | 2.70(0.73) | 19.71(1.82) | 54 011.60(1.35) | 0.00(0.01) | 54 017.31(0.01) | 16.42(0.84) | 0.67(0.04) | 1.47(0.50) | 12.69(2.18) | 54 002.73(2.51) | 20.86(0.06) | −20.62 |
| 2006jo | 79.24(3.56) | 2.24(0.12) | 8.10(0.69) | 54 013.57(0.48) | 4.44(0.52) | 54 015.89(0.01) | 48.39(1.59) | 1.35(0.08) | 1.66(0.13) | 12.58(5.55) | 54 002.35(5.98) | 19.69(0.04) | −19.44 |
| 2006lc | 733.85(11.82) | 3.36(0.04) | 14.37(0.35) | 54 037.99(0.22) | 0.00(0.48) | 54 042.04(0.01) | 426.02(4.12) | 0.85(0.02) | 1.07(0.02) | 26.37(3.93) | 54 015.24(1.97) | 17.33(0.01) | −18.44 |
| 2006nx | 61.13(4.60) | 3.57(0.19) | 16.16(3.31) | 54 051.16(1.25) | … | 54 056.27(0.01) | 36.05(0.72) | 0.74(0.13) | 0.94(0.07) | 15.29(1.33) | 54 038.89(1.51) | 20.01(0.02) | −20.75 |
| 2006qk | … | … | … | … | … | … | … | … | … | … | 54 058.15(1.01) | … | … |
| 2007ms | 165.18(2.91) | 4.02(0.36) | 26.90(1.37) | 54 369.48(0.41) | 9.53(2.89) | 54 376.75(0.01) | 117.87(3.44) | 0.39(0.02) | 0.58(0.09) | 24.62(4.83) | 54 351.17(5.02) | 18.72(0.03) | −18.05 |
| 2007nc | 25.49(2.49) | 3.39(0.48) | 25.13(4.83) | 54 387.68(1.43) | 0.00(1.26) | 54 394.52(0.01) | 17.17(0.77) | 0.49(0.07) | 0.91(0.21) | 15.79(3.66) | 54 377.36(3.97) | 20.81(0.05) | −17.90 |
| 2007qv | 30.32(2.96) | 1.04(0.27) | … | 54 409.66(0.44) | 0.00(2.31) | 54 414.83(0.01) | 28.61(0.72) | 0.15(0.07) | … | 8.78(2.70) | 54 405.22(2.96) | 20.26(0.03) | −18.06 |
| 2007qx | 42.16(9.09) | 4.61(0.74) | … | 54 420.04(3.44) | 0.55(1.77) | 54 424.39(0.01) | 23.55(1.53) | 0.66(0.36) | 0.58(0.17) | 24.15(4.59) | 54 398.30(4.96) | 20.47(0.07) | −18.48 |
| 2007sj | … | … | … | … | … | … | … | … | … | … | 54 414.24(2.00) | … | … |

**Notes.** $A$, $\tau_{\rm rise}$, $\tau_{\rm fall}$, $t_0$ and $C$ are the parameters included in Eq. (1). $t_{\rm max}$, $F_{\rm max}$, $\Delta m_{15}$, $\Delta m_{-10}$, $t_{\rm rise}$ and $t_{\rm expl}$ are defined in Sect. 3.1 and 3.2.2. $m_{\rm max}$ is the peak apparent magnitude, $M_{\rm max}$ the peak absolute magnitude (host-extinction corrected). The error on $M_{\rm max}$ is about 0.15 mag, which is mainly due to the uncertainty on the distance (∼7%).

**Table 3.** continued.

| SN | $A$ ($\mu$Jy) | $\tau_{\rm rise}$ (days) | $\tau_{\rm fall}$ (days) | $t_0$ (MJD) | $C$ ($\mu$Jy) | $t_{\rm max}$ (MJD) | $F_{\rm max}$ ($\mu$Jy) | $\Delta m_{15}$ (mag) | $\Delta m_{-10}$ (mag) | $t_{\rm rise}$ (days) | $t_{\rm expl}$ (MJD) | $m_{\rm max}$ (mag) | $M_{\rm max}$ (mag) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $i$ band | | | | | | | |
| 2005fk | 17.12(4.16) | 2.12(0.85) | 12.41(5.07) | 53 625.43(6.43) | 0.67(0.65) | 53 629.66(3.87) | 11.51(1.94) | 1.00(0.61) | 1.96(1.12) | ... | | 21.25(0.18) | −19.50 |
| 2005hl | 376.90(5.43) | 5.02(0.29) | 18.95(0.89) | 53 628.36(0.58) | 48.04(2.39) | 53 633.60(0.24) | 259.41(2.47) | 0.42(0.01) | 0.39(0.04) | ... | | 17.87(0.01) | −18.41 |
| 2005hm | 114.03(3.60) | 3.41(0.23) | 18.09(1.30) | 53 645.37(0.43) | 18.57(1.79) | 53 650.52(0.30) | 88.86(2.23) | 0.50(0.03) | 0.70(0.06) | 22.55(1.05) | | 19.03(0.03) | −16.97 |
| 2005kr | 64.93(8.67) | 3.96(0.44) | 15.56(9.31) | 53 687.40(2.62) | 0.00(0.00) | 53 692.23(1.08) | 36.83(1.78) | 0.74(0.23) | 0.79(0.15) | 17.04(2.45) | | 19.98(0.05) | −19.36 |
| 2006fo | 628.76(6.50) | 4.90(0.10) | 19.42(0.82) | 54 004.23(0.49) | 113.66(3.86) | 54 009.66(0.24) | 471.03(2.22) | 0.38(0.01) | 0.37(0.01) | 24.24(9.38) | | 17.22(0.01) | −18.22 |
| 14475 | 25.72(1.77) | 3.21(0.52) | 25.69(6.84) | 54 013.01(3.33) | 0.00(1.77) | 54 020.19(1.75) | 17.65(0.80) | 0.49(0.13) | 0.99(0.39) | 15.20(5.26) | | 20.78(0.05) | −20.23 |
| 2006jo | 85.60(4.46) | 2.45(0.19) | 8.57(0.96) | 54 014.98(0.73) | 5.72(0.80) | 54 017.40(0.36) | 52.78(2.32) | 1.22(0.09) | 1.42(0.16) | 13.98(5.69) | | 19.59(0.05) | −19.22 |
| 2006lc | 819.56(17.18) | 2.83(0.14) | 15.50(0.58) | 54 038.27(0.17) | 38.80(8.57) | 54 042.59(0.15) | 548.14(10.00) | 0.75(0.02) | 1.23(0.06) | 26.91(3.96) | | 17.05(0.02) | −18.34 |
| 2006nx | 46.91(4.75) | 2.75(0.31) | 32.35(13.88) | 54 048.30(0.96) | 0.00(0.20) | 54 055.72(0.61) | 35.08(1.10) | 0.41(0.12) | 1.21(0.19) | 14.81(1.69) | | 20.04(0.03) | −20.35 |
| 2007nc | 30.87(3.52) | 4.33(0.80) | 20.79(5.33) | 54 391.71(2.95) | 0.00(1.59) | 54 397.99(1.41) | 18.51(1.01) | 0.54(0.12) | 0.63(0.20) | 18.98(5.64) | | 20.73(0.06) | −17.82 |
| 2007qv | 31.58(1.14) | 0.99(0.17) | ... | 54 409.72(0.24) | 0.00(0.00) | 54 414.67(3.37) | 29.80(0.85) | 0.16(0.05) | ... | 8.63(14.05) | | 20.21(0.03) | −18.07 |
| 2007qx | 45.70(9.94) | 4.30(1.33) | ... | 54 420.19(3.49) | 0.00(2.55) | 54 423.76(2.27) | 24.48(2.55) | 0.80(1.55) | 0.69(0.35) | 21.61(9.74) | | 20.43(0.11) | −18.27 |
| | | | | | | $z$ band | | | | | | | |
| 2005hl | 299.31(14.31) | 4.75(0.66) | 39.43(6.86) | 53 623.11(1.27) | 32.91(17.20) | 53 632.77(0.75) | 240.14(4.83) | 0.24(0.02) | 0.34(0.08) | ... | | 17.95(0.02) | −17.97 |
| 2005hm | 93.60(9.55) | 4.23(1.18) | 43.47(11.28) | 53 640.36(2.24) | 0.00(8.28) | 53 650.11(2.00) | 68.03(7.34) | 0.27(0.09) | 0.47(0.41) | 22.15(4.96) | | 19.32(0.12) | −16.65 |
| 2006fe | 60.21(9.27) | 5.68(2.52) | 38.16(10.74) | 53 980.90(11.04) | 0.00(3.03) | 53 991.51(8.37) | 39.54(5.04) | 0.27(0.49) | 0.30(4.89) | ... | | 19.91(0.14) | −17.95 |
| 2006fo | 412.58(15.29) | 3.93(0.28) | 34.26(4.91) | 54 000.41(1.15) | 141.81(18.95) | 54 008.61(0.76) | 430.81(3.52) | 0.22(0.01) | 0.37(0.04) | 23.21(9.90) | | 17.31(0.01) | −17.93 |
| 2006jo | 67.27(13.17) | 2.39(0.78) | 11.41(6.74) | 54 012.88(3.87) | 8.87(3.99) | 54 016.30(1.68) | 49.15(6.85) | 0.85(0.28) | 1.25(0.61) | 12.96(8.39) | | 19.67(0.15) | −18.83 |
| 2006lc | 749.56(25.35) | 3.78(0.18) | 23.76(1.52) | 54 037.90(0.41) | 0.00(13.44) | 54 044.30(0.22) | 483.79(7.35) | 0.50(0.03) | 0.77(0.05) | 28.59(3.98) | | 17.19(0.02) | −17.87 |
| 2007ms | 174.71(10.99) | 5.32(1.24) | 53.65(5.06) | 54 369.26(1.75) | 0.00(6.41) | 54 381.45(2.81) | 126.48(7.54) | 0.20(0.02) | 0.27(0.33) | 29.14(12.70) | | 18.65(0.06) | −17.85 |

**Table 4.** Well-constrained $R/r$-band light-curve rise-times and $\Delta m_{-10}$ for 4, 13, 10 and 9 SNe IIb, Ib, Ic and Ic-BL in the literature.

| SN | Type | $t_{\rm rise}$ (days) | $\Delta m_{-10}$ (mag) | Ref. |
|---|---|---|---|---|
| 1993J | IIb | 22.53(3.24) | 0.77(0.15) | Kumar et al. (2013), Richmond et al. (1994) |
| 2008ax | IIb | 21.50(0.40) | 0.63(0.15) | Taubenberger et al. (2011) |
| 2011dh | IIb | 21.86(0.23) | 0.61(0.10) | Ergon et al. (2014) |
| 2011fu | IIb | 26.40(2.90) | 0.42(0.15) | Kumar et al. (2013) |
| 1998dt | Ib | 17.60(3.00) | 1.00(0.10) | Matheson et al. (2001) |
| 1999ex | Ib | 20.49(0.52) | 0.38(0.10) | Stritzinger et al. (2002); |
| 2004dk | Ib | 23.75(1.55) | 0.50(0.10) | Drout et al. (2011) |
| 2005hm | Ib | 21.06(1.17) | 0.76(0.03) | This paper |
| 2006fo | Ib | ... | 0.38(0.01) | This paper |
| 2006lc | Ib | 26.41(5.18) | 1.08(0.02) | This paper |
| 2007Y | Ib | 21.00(0.50) | 0.67(0.10) | Stritzinger et al. (2009) |
| 2007nc | Ib | ... | 0.80(0.15) | This paper |
| 2007uy | Ib | 21.72(2.50) | ... | Roy et al. (2013), explosion date from modelling of radio data |
| 2008D | Ib | 20.75(1.00) | 0.31(0.10) | Soderberg et al. (2008), Malesani et al. (2009) |
| 2009jf | Ib | 24.50(1.00) | 0.34(0.10) | Valenti et al. (2011), good pre-explosion limit |
| 2011ei | Ib | 19.50(2.50) | 0.69(0.20) | Milisavljevic et al. (2013) |
| iPTF 13bvn | Ib | 18.55(0.70) | 0.57(0.10) | Fremling et al. (2014) |
| 1994I | Ic | 10.01(1.02) | 2.50(0.50) | Richmond et al. (1996) |
| 2004aw | Ic | ... | 0.27(0.05) | Taubenberger et al. (2006) |
| 2004dn | Ic | ... | 0.60(0.15) | Drout et al. (2011) |
| 2004fe | Ic | ... | 1.20(0.10) | Drout et al. (2011) |
| 2007gr | Ic | 15.50(3.02) | 0.73(0.04) | Hunter et al. (2009) |
| 2007ms | Ic | ... | 0.56(0.08) | This paper |
| 2007qv | Ic | 8.72(3.08) | ... | This paper |
| 2007qx | Ic | ... | 0.62(0.17) | This paper |
| PTF 10vgv | Ic | 11.91(0.85) | 2.63(0.50) | Corsi et al. (2012) |
| 2013dk | Ic | ... | 1.33(0.20) | Elias-Rosa et al. (2013), $\Delta m_{-10}$ scaled to $r$ from $V$ |
| 1998bw | Ic-BL | 17.50(0.50) | 0.68(0.15) | Clocchiatti et al. (2011) |
| 2003jd | Ic-BL | 16.20(1.00) | ... | Valenti et al. (2008), only error on max epoch |
| 2005kr | Ic-BL | 15.40(1.45) | 1.18(0.16) | This paper |
| 14475 | Ic-BL | 14.36(2.58) | 1.15(0.31) | This paper |
| 2006aj | Ic-BL | 12.30(0.50) | 2.40(0.50) | Ferrero et al. (2007), $\Delta m_{-10}$ is extrapolated |
| 2006nx | Ic-BL | 14.99(1.41) | 1.10(0.12) | This paper |
| 2009bb | Ic-BL | 14.65(1.25) | 1.37(0.20) | Pignata et al. (2011) |
| 2010bh | Ic-BL | 8.00(1.00) | 2.00(0.50) | Bufano et al. (2012), $\Delta m_{-8}$ |
| PTF 12gzk | Ic-BL | 20.74(0.62) | 0.45(0.10) | Ben-Ami et al. (2012) |

**Table 5.** Parameters from the fit of the 14 SDSS Ib/c SN pseudo-bolometric light curves (host-extinction corrections included).

| SN | $A$ ($10^{41}$erg s$^{-1}$) | $\tau_{\rm rise}$ (days) | $\tau_{\rm fall}$ (days) | $t_0$ (MJD) | $C$ ($10^{41}$erg s$^{-1}$) | $t_{\rm max}$ (MJD) | $L_{\rm max}$ ($10^{41}$erg s$^{-1}$) | $\Delta m_{15}$ (mag) | $\Delta m_{-10}$ (mag) | $t_{\rm rise}$ (days) | $\alpha$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2005hl | 75.24(0.22) | 5.79(0.09) | 11.75(0.30) | 53 628.26(0.39) | 9.37(0.10) | 53 628.44(0.10) | 46.99(0.12) | 0.54(0.01) | 0.28(0.01) | ... | ... |
| 2005hm | 16.27(0.76) | 3.22(0.19) | 13.04(1.42) | 53 641.96(0.94) | 1.77(0.21) | 53 645.68(0.55) | 11.08(0.25) | 0.73(0.05) | 0.87(0.09) | 17.87(1.26) | ... |
| 2005kr | 106.37(11.61) | 1.93(0.47) | 25.79(12.48) | 53 680.21(1.02) | 0.00(2.86) | 53 685.70(1.23) | 81.56(4.66) | 0.55(0.13) | 2.47(0.97) | 11.29(2.78) | 1.42 |
| 2005ks | 164.92(25.52) | 4.46(1.30) | 12.12(13.90) | 53 687.82(8.73) | 0.00(0.01) | 53 690.47(5.29) | 85.43(9.37) | 0.87(2.99) | 0.64(1.41) | 14.88(28.91) | 0.26 |
| 2006fe | 47.85(3.88) | 0.37(0.23) | 16.73(2.44) | 53 974.58(0.28) | 4.32(0.63) | 53 976.10(0.88) | 47.30(3.17) | 0.82(0.09) | 2.60(0.19) | ... | ... |
| 2006fo | 54.61(0.22) | 4.51(0.07) | 12.36(0.16) | 54 001.54(0.24) | 7.93(0.07) | 54 004.09(0.09) | 36.26(0.20) | 0.60(0.01) | 0.45(0.01) | 18.78(9.33) | ... |
| 14475 | 309.09(6.87) | 8.32(0.33) | 10.18(2.04) | 54 028.05(0.49) | 0.00(0.65) | 54 013.71(0.63) | 192.16(2.76) | 0.35(0.06) | 0.09(0.76) | 9.56(2.59) | 0.55 |
| 2006jo | 170.23(4.16) | 2.38(0.09) | 7.21(0.39) | 54 012.67(0.39) | 10.10(0.54) | 54 014.48(0.17) | 100.36(1.64) | 1.43(0.05) | 1.46(0.09) | 11.27(5.58) | ... |
| 2006lc | 62.70(0.33) | 2.74(0.01) | 13.66(0.13) | 54 036.58(0.05) | 0.93(0.23) | 54 040.43(0.02) | 38.91(0.16) | 0.91(0.00) | 1.45(0.01) | 12.99(1.93) | 1.81 |
| 2006nx | 464.77(19.19) | 2.48(0.49) | 12.13(2.32) | 54 050.21(0.71) | 37.51(7.55) | 54 054.04(0.46) | 317.56(3.58) | 0.89(0.11) | 1.38(0.18) | 13.32(1.54) | 3.58 |
| 2007ms | 42.32(1.15) | 3.59(0.22) | 17.65(1.28) | 54 368.79(0.42) | 4.67(0.59) | 54 373.88(0.30) | 30.22(1.06) | 0.54(0.04) | 0.71(0.07) | 21.86(4.92) | ... |
| 2007nc | 37.43(4.90) | 3.12(0.92) | 4.80(5.67) | 54 400.04(4.49) | 6.14(3.27) | 54 397.93(1.81) | 25.74(3.28) | 1.19(0.31) | 0.53(0.12) | 18.93(6.92) | 0.09 |
| 2007qv | 36.21(3.54) | 0.70(0.25) | 52.79(15.17) | 54 409.36(0.55) | 0.00(2.35) | 54 412.67(0.93) | 33.74(1.23) | 0.29(0.10) | 10.57(3.49) | 6.80(3.56) | ... |
| 2007qx | 65.95(7.89) | 2.94(0.40) | 11.35(2.50) | 54 417.48(1.37) | 4.53(1.89) | 54 420.81(0.64) | 41.75(1.19) | 0.92(0.20) | 1.10(0.15) | 20.84(5.00) | 1.08 |
| 2007sj | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1.01 |

**Notes.** $A$, $\tau_{\rm rise}$, $\tau_{\rm fall}$, $t_0$ and $C$ are the parameters included in Eq. (1). $t_{\rm max}$, $F_{\rm max}$, $\Delta m_{15}$, $\Delta m_{-10}$ and $t_{\rm rise}$ are defined in Sects. 3.1 and 3.2.2. $\alpha$ is the exponent of the best PL fit to the early quasi-bolometric light curves, see Sect. 3.4.1 and Fig. 22.

**Table 6.** $^{56}$Ni mass, ejecta mass, explosion energy and progenitor radius for the SDSS sample of SNe Ib/c.

| SN | Type | $M_{^{56}\mathrm{Ni}}$ ($M_\odot$) | $M_{\mathrm{ej}}$ ($M_\odot$) | $E_{\mathrm{K}}$ (foe) | $R$ ($R_\odot$) |
|---|---|---|---|---|---|
| 2005fk | Ic-BL | ... | ... | ... | <38.1 |
| 2005hl | Ib | $0.33^{+0.05}_{-0.05}$ | $1.56^{+2.88}_{-1.05}$ | $0.64^{+2.40}_{-0.43}$ | <357.4 |
| 2005hm | Ib | $0.11^{+0.01}_{-0.01}$ | $3.45^{+1.54}_{-0.40}$ | $0.36^{+0.50}_{-0.04}$ | <57.2 |
| 2005kr | Ic-BL | $0.71^{+0.04}_{-0.04}$ | $7.75^{+5.48}_{-1.94}$ | $15.18^{+28.00}_{-3.80}$ | <6.0 |
| 2005ks | Ic-BL | $0.60^{+0.02}_{-0.02}$ | $3.39^{+1.53}_{-0.32}$ | $1.17^{+1.65}_{-0.11}$ | <87.9 |
| 2005mn | Ib | ... | ... | ... | <25.4 |
| 2006fe | Ic | ... | ... | ... | <116.0 |
| 2006fo | Ib | $0.38^{+0.01}_{-0.06}$ | $6.04^{+5.57}_{-2.73}$ | $1.90^{+1.65}_{-0.86}$ | <172.2 |
| 14475 | Ic-BL | $1.27^{+0.08}_{-0.09}$ | $2.90^{+3.38}_{-1.48}$ | $4.71^{+12.29}_{-2.41}$ | <93.1 |
| 2006jo | Ib | $0.42^{+0.05}_{-0.08}$ | $2.51^{+4.98}_{-2.14}$ | $2.83^{+11.24}_{-2.42}$ | <152.1 |
| 2006lc | Ib | $0.30^{+0.03}_{-0.03}$ | $3.67^{+4.96}_{-1.79}$ | $1.60^{+4.68}_{-0.78}$ | 1.7 |
| 2006nx | Ic-BL | $1.86^{+0.12}_{-0.12}$ | $7.52^{+4.83}_{-1.74}$ | $21.60^{+37.53}_{-5.01}$ | <53.9 |
| 2006qk | Ic | ... | ... | ... | <5.1 |
| 2007ms | Ic | $0.39^{+0.03}_{-0.03}$ | $9.12^{+8.45}_{-2.76}$ | $2.05^{+4.54}_{-0.62}$ | <40.7 |
| 2007nc | Ib | $0.24^{+0.02}_{-0.03}$ | $4.38^{+4.87}_{-2.02}$ | $1.54^{+3.88}_{-0.71}$ | <34.4 |
| 2007qv | Ic | $0.20^{+0.04}_{-0.03}$ | $1.91^{+3.81}_{-1.34}$ | $1.92^{+7.64}_{-1.34}$ | 11.5 |
| 2007qx | Ic | $0.40^{+0.15}_{-0.08}$ | $6.21^{+12.10}_{-3.20}$ | $1.28^{+5.02}_{-0.66}$ | <28.7 |
| 2007sj | Ic | ... | ... | ... | <1.6 |
| ⟨Ib⟩ | | 0.30 ± 0.05 | 3.60 ± 0.63 | 1.48 ± 0.36 | |
| ⟨Ic⟩ | | 0.33 ± 0.07 | 5.75 ± 2.09 | 1.75 ± 0.24 | |
| ⟨Ic-BL⟩ | | 1.11 ± 0.29 | 5.39 ± 1.30 | 10.66 ± 4.70 | |

**Notes.** The reported errors are due to the uncertainty on the rise time. Typical uncertainties on the $^{56}$Ni mass due to the error on the distance are ∼7%.

**Table 7.** Limits on the early plateau parameters and peak luminosity values for the SDSS sample of SNe Ib/c (host extinction included).

| SN | Type | $\Delta t_{\mathrm{p}}$ (days) | $\log_{10}(\Delta L_{\text{last non-det.}})$ ($\log_{10}$[erg s$^{-1}$]) | $\log_{10}(L_{\mathrm{p}})$ ($\log_{10}$[erg s$^{-1}$]) | $\log_{10}(L_{\mathrm{max}})$ ($\log_{10}$[erg s$^{-1}$]) | $\Delta M$ (peak/last non-det.) (mag) | $\Delta M$ (peak/1st det.) (mag) |
|---|---|---|---|---|---|---|---|
| 2005hl | Ib | ... | ... | <42.63 | 42.67 | 6.08 | 0.10 |
| 2005hm | Ib | <6.8* | <40.35 | <41.56 | 42.04 | 4.23 | 1.21 |
| 2005kr | Ic-BL | <2.6 | <41.57 | <41.95 | 42.91 | 3.36 | 2.41 |
| 2005ks | Ic-BL | <1.8 | <41.21 | <42.15 | 42.93 | 4.29 | 1.97 |
| 2005mn | Ib | <8.6 | <40.99 | <41.80 | ... | ... | ... |
| 2006fe | Ic | ... | ... | <42.24 | 42.67 | 4.26 | 1.10 |
| 2006fo | Ib | <18.6 | <39.90 | <42.39 | 42.56 | 6.65 | 0.42 |
| 14475 | Ic-BL | <4.4 | <41.63 | <42.73 | 43.28 | 4.14 | 1.40 |
| 2006jo | Ib | <11.1 | <40.99 | <42.75 | 43.00 | 5.03 | 0.62 |
| 2006lc | Ib | 5.9−17.6 | ... | 40.91 | 42.59 | ... | 4.20 |
| 2006nx | Ic-BL | <2.6 | <41.41 | <42.83 | 43.50 | 5.24 | 1.68 |
| 2006qk | Ic | <1.9 | <40.98 | <41.18 | ... | ... | ... |
| 2007ms | Ic | <9.7 | <40.51 | <41.81 | 42.48 | 4.93 | 1.67 |
| 2007nc | Ib | <7.3 | <41.51 | <41.86 | 42.42 | 2.27 | 1.42 |
| 2007qv | Ic | <5.4 | <41.51 | <41.81 | 42.53 | 2.55 | 1.79 |
| 2007qx | Ic | <1.8** | ... | 41.63*** | 42.62 | ... | 2.47 |
| 2007sj | Ic | <3.8 | <40.53 | <40.78 | ... | ... | ... |

**Notes.** $\Delta t_{\mathrm{p}}$ corresponds to the time interval between last non-detection and first detection in the rest frame, $L_{\mathrm{p}}$ to the luminosity of the 1st detection. The limit on the luminosity of the last non-detection ($\Delta L_{\text{last non-detec.}}$) corresponds to its 1$\sigma$ error. The last two columns ($\Delta M$) report the difference in magnitude between the peak and the last non-detection limit, and the difference in magnitude between peak and the 1st-detection luminosity. (*) Time interval between the first two epochs; (**) Time interval between the second and the fourth epoch; (***) Luminosity of the third epoch.