Table 7. JD and magnitude of last-non detection, discovery, and confirmation epochs and estimated explosion epoch for 33 CSP-I SE SNe.

SN	Discovery telegram	Last non-detection (JD–2 450 000)	Discovery (JD–2 450 000)	Confirmation (JD–2 450 000)	Last non-detection (mag)	Discovery (mag)	Confirmation (mag)	Explosion date (JD–2 450 000)
2004ex	IAUC 8418	3272.77	3289.84	3291.83	>19.0	17.7	17.7	$3288.40^{0.33}_{-0.33}$ ^{R}
2004ff	IAUC 8425	3291.91	3308.90	3309.91	>19.0	18.0	18.0	$3298.16^{8.22}_{-6.25}$ ^{R}
2004gq	IAUC 8452	3343.88	3350.86	3351.43	>19.5	15.5	15.9	$3347.37^{3.49}_{-3.49}$ ^{L}
2004gt	IAUC 8454	3136.75	3351.58	3355.51	>15.7	14.9	14.6	$3343.33^{4.08}_{-4.08}$ ^{R}
2004gv	IAUC 8454	3338.24	3353.17	3354.07	>18.6	17.6	17.4	$3345.77^{1.54}_{-1.54}$ ^{R}
2005aw	CBET 127	3436.82	3453.77	3454.75	>17.9	15.3	15.3	$3446.17^{3.00}_{-3.00}$ ^{R}
2005em	IAUC 8604	3615.93	3640.94	3641.88	>19.5	18.1	18.0	$3638.66^{2.28}_{-3.00}$ ^{T}
2006T	CBET 385	3752.45	3766.49	3767.35	>18.0	17.2	17.4	$3758.14^{0.92}_{-0.92}$ ^{R}
2006ba	CBET 443	3771.54	3814.31	3820.35	>18.8	18.4	17.7	$3801.61^{3.00}_{-3.00}$ ^{T}
2006bf	IAUC 8693	3741.50	3821.85	3822.62	>19.3	17.7	17.7	$3798.15^{3.35}_{-3.35}$ ^{T}
2006ep	CBET 609	3974.14	3977.85	3979.10	>19	17.8	17.8	$3975.99^{1.86}_{-1.86}$ ^{L}
2006ir	CBET 658	...	4001.80	...	...	16.9	...	$3988.76^{3.35}_{-3.35}$ ^{T}
2006lc	CBET 688	...	4029.50	...	...	20.2	...	$4015.24^{1.97}_{-1.97}$ ^{b}
2007C	CBET 798	4093.37	4108.36	4109.20	>18.5	15.9	16.0	$4095.94^{3.30}_{-2.57}$ ^{T}
2007Y	CBET 845	4083.35	4147.27	4148.24	>18.0	17.5	17.1	$4145.50^{2.00}_{-2.00}$ ^{a}
2007ag	CBET 868	4155.50	4166.79	4167.62	>19.4	18.0	17.5	$4155.50^{3.32}_{-0.00}$ ^{T}
2007hn	CBET 1050	...	4343.70	...	...	18.6	...	$4341.32^{2.38}_{-3.02}$ ^{T}
2007kj	CBET 1092	4364.11	4376.10	4376.95	>19.0	17.4	17.3	$4364.11^{3.00}_{-0.00}$ ^{T}
2007rz	CBET 1158	4423.91	4442.90	4443.92	>19.5	16.9	16.9	$4427.00^{3.35}_{-3.09}$ ^{T}
2008aq	CBET 1271	4506.97	4523.94	4524.90	>19.1	16.3	16.2	$4511.29^{3.00}_{-3.00}$ ^{T}
2008gc	CBET 1529	4651.78	4742.66	4743.65	>18.0	17.4	17.3	$4724.95^{3.29}_{-3.29}$ ^{T}
2009bb	CBET 1731	4909.70	4911.61	4913.51	>18	17.0	16.6	$4909.60^{0.60}_{-0.60}$ ^{c}
2009K	CBET 1663	4842.58	4845.57	4846.56	>18.0	14.9	15.0	$4844.07^{1.49}_{-1.49}$ ^{L}
2009Z	CBET 1685	4617-67**	4865.03	4866.97	>19.4	18.1	17.8	$4860.54^{0.56}_{-0.56}$ ^{R}
2009ca	CBET 1750	4766.69	4920.87	4924.86*	>18.5	17.1	17.1	$4915.86^{3.35}_{-3.35}$ ^{T}
2009dt	CBET 1785	4942.86	4949.83	4950.82	>19.0	17.2	16.6	$4946.34^{3.49}_{-3.48}$ ^{L}
2004ew	CBET 96	3260.71	3288.42	3289.26	>18.1	17.5	17.5	$3260.71^{3.35}_{-0.00}$ ^{T}
2004fe	IAUC 8425	3300.78	3308.79	3309.80	>19.0	18.1	17.7	$3307.24^{1.55}_{-3.00}$ ^{T}
2005Q	CBET 106	3370.31	3399.30	3400.26	>20.5	17.2	17.1	$3386.20^{3.00}_{-3.00}$ ^{T}
2005bj	CBET 137	3191.50	3471.60	3472.51	>19.5	17.7	17.7	$3452.58^{3.00}_{-3.00}$ ^{T}
2006fo	CBET 624	...	3994.50	...	...	18.2	...	$3983.86^{3.00}_{-3.00}$ ^{T}
2008hh	CBET 1575	4759.50	4789.62	4790.65	>19.2	16.6	16.6	$4781.19^{3.35}_{-3.35}$ ^{T}
2009dp	CBET 1779	4923.60	4944.60	4945.62	>18.5	17.7	17.7	$4939.50^{3.35}_{-3.35}$ ^{T}

Notes. A horizontal line separates the objects observed in both optical and NIR from those observed only in the optical. $^{(a)}$ From Stritzinger et al. (2009). $^{(b)}$ From Taddia et al. (2015). $^{(c)}$ From Pignata et al. (2011). $^{(L)}$ From good pre-explosion limits. $^{(R)}$ From the fit of the photospheric radius before r_{max}. $^{(T)}$ From the rise time.

photospheric velocity (v_{ph}). Measured as the Doppler velocity at maximum absorption, v_{ph} serves as an important constraint on the ratio between the E_K and M_{ej}. In the following, v_{ph} values are adopted from Doppler velocity measurements of the Fe II λ5169 feature (cf. Branch et al. 2002; Richardson et al. 2006), which are presented in a companion paper by Holmbo et al. (in prep.). Plotted in Fig. 16 are the resulting v_{ph} values versus days relative to explosion epoch, with the associated uncertainties being on the order of 500 km s^{-1}. Inspection of the v_{ph} measurements reveals similar values for each of the SE SN subtypes over the same epochs, and the evolution of v_{ph} is found to be well-represented by a PL function characterized by an index $\alpha = -0.41$ (dashed line in Fig. 16). As expected, the Type Ic-BL SN 2009bb and SN 2009ca exhibit significantly higher v_{ph} values, several thousand of km s^{-1} higher than the rest of the sample over the same epochs. These two objects are omitted when computing the PL fit.

For the semi-analytic models we use the value of v_{ph} at peak luminosity [$v_{ph}(t_{max})$] to constrain E_K/M_{ej}. These are computed by fitting a PL to the measured Fe II λ5169 velocities for each