

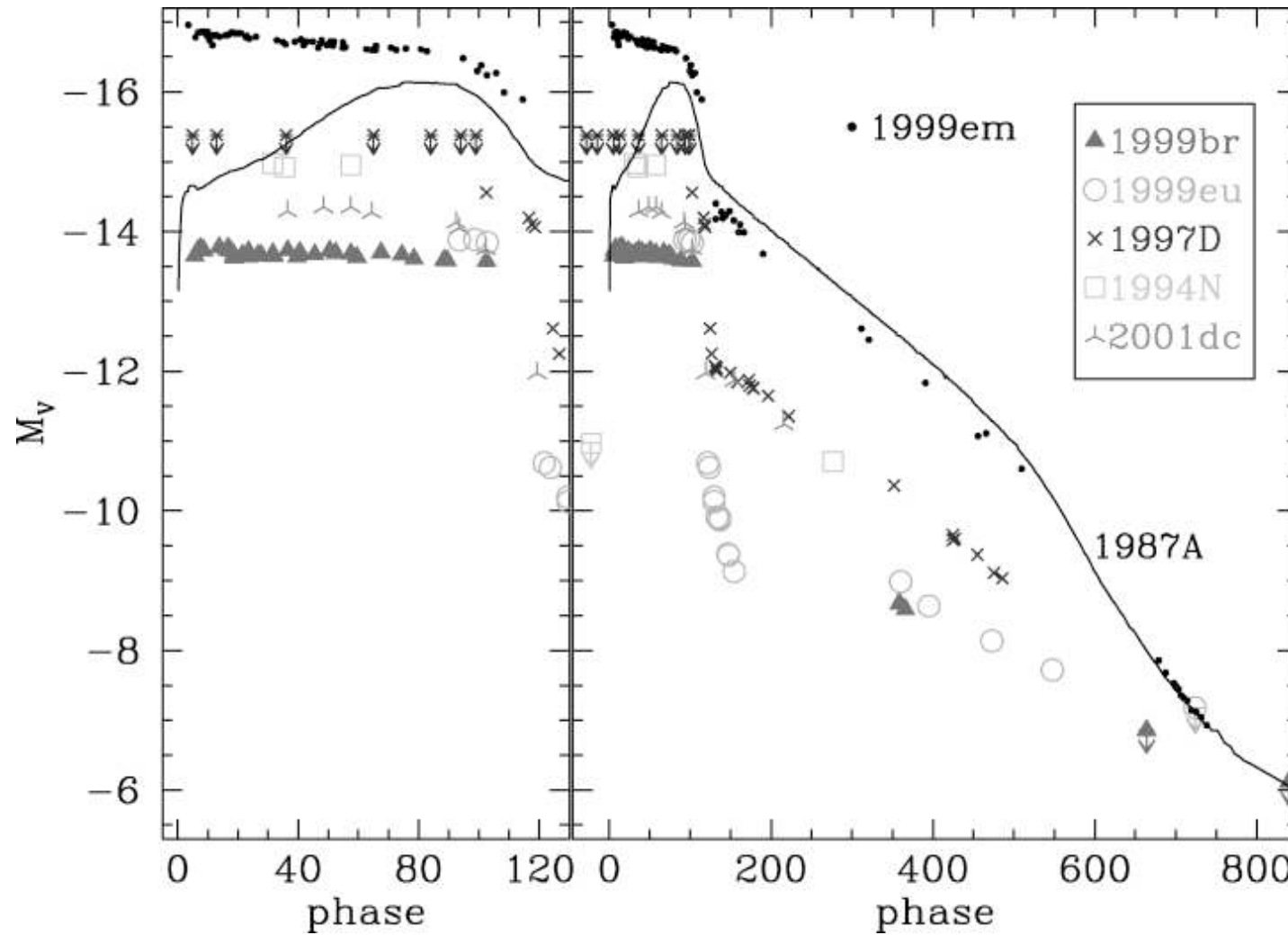
Low luminosity IIP SNe

Giuliano Pignata

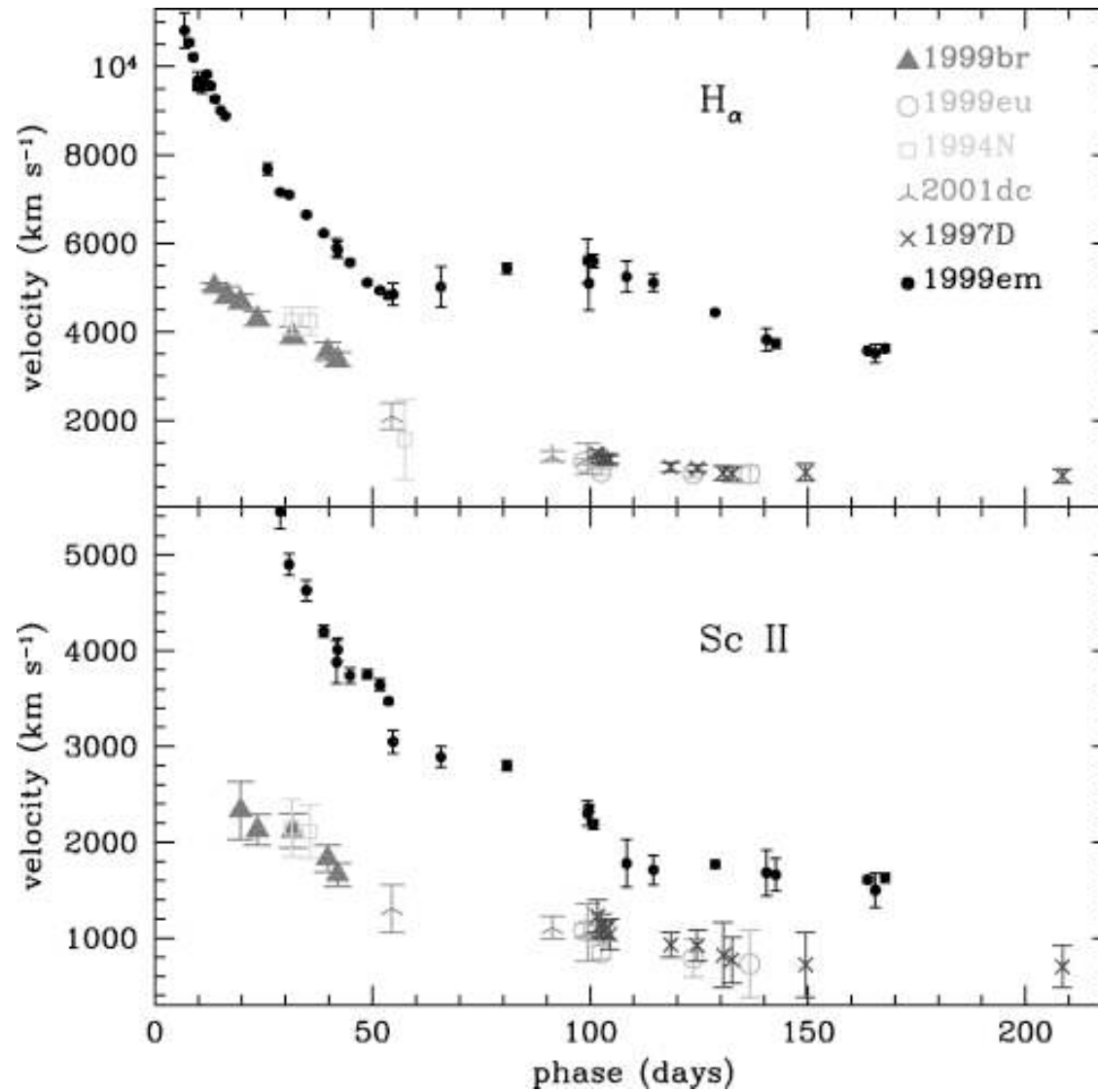
Universidad de Chile



Luminosity

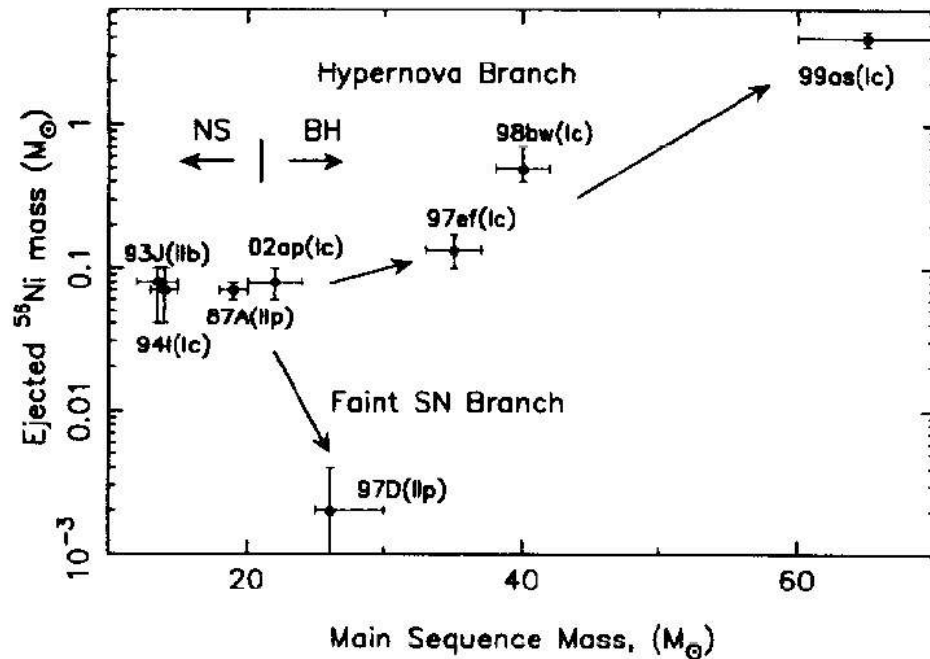


Velocity

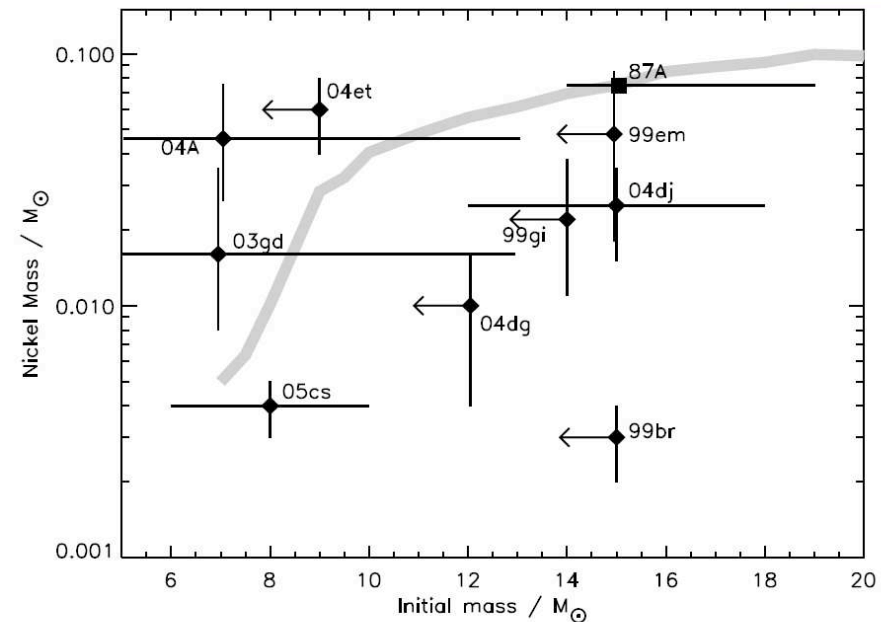


Progenitor mass problem ?

Low Ni production $2-8 \times 10^{-3}$ (normal $\sim 6-10 \times 10^{-2}$)



Nomoto et al 2003



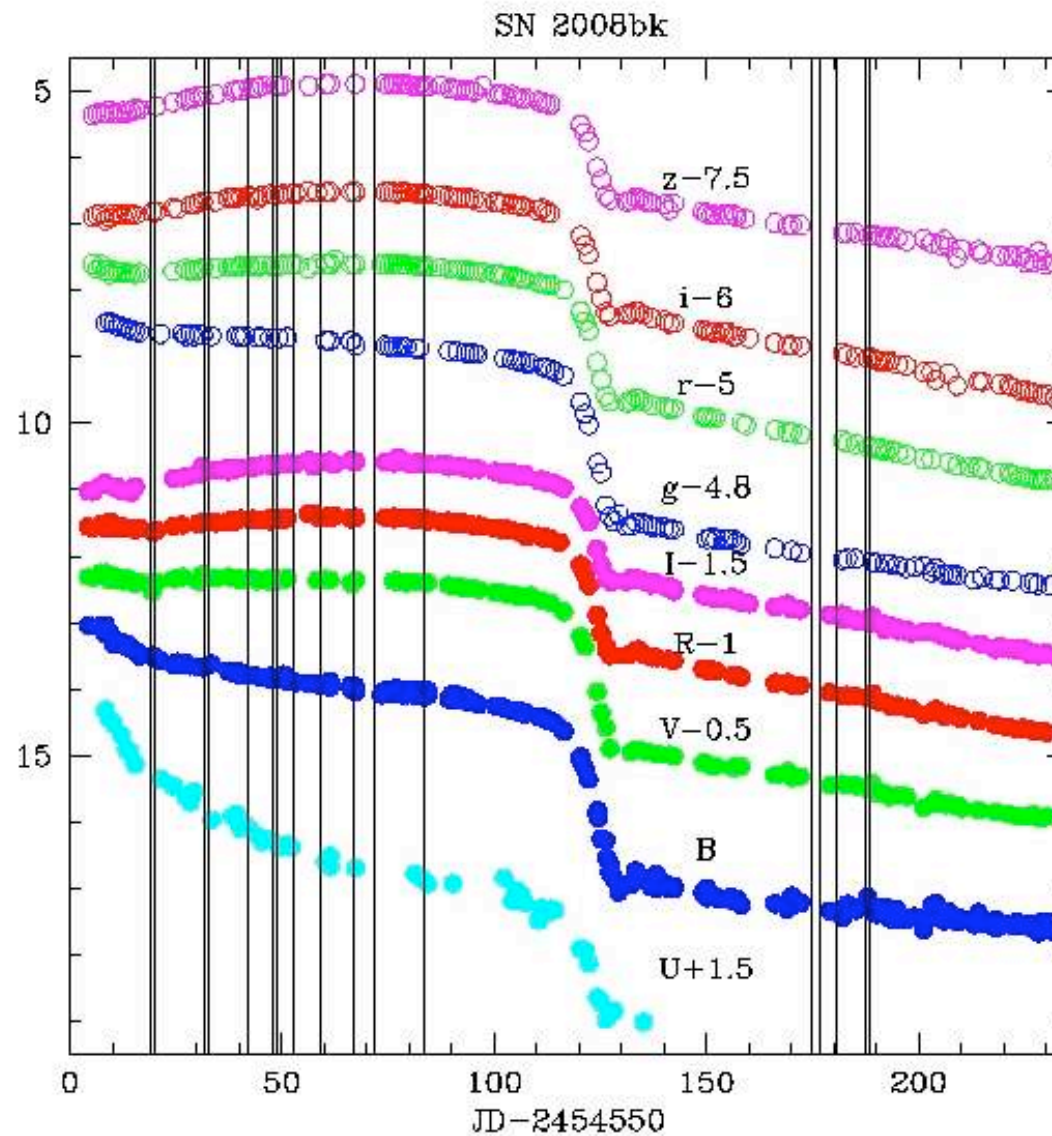
Smartt et al. 2008

1997D: $M \sim 26 M_{\text{sun}}$ (Turatto et al. 1998, Zampieri 2003, Nomoto 2003)

$M \sim 9 M_{\text{sun}}$ (Chugay & Utrobin 2000)

2003Z: $M \sim 14.4-17.4 M_{\text{sun}}$ (Utrobin 2007)

Optical light curve



Also JHK from CSP

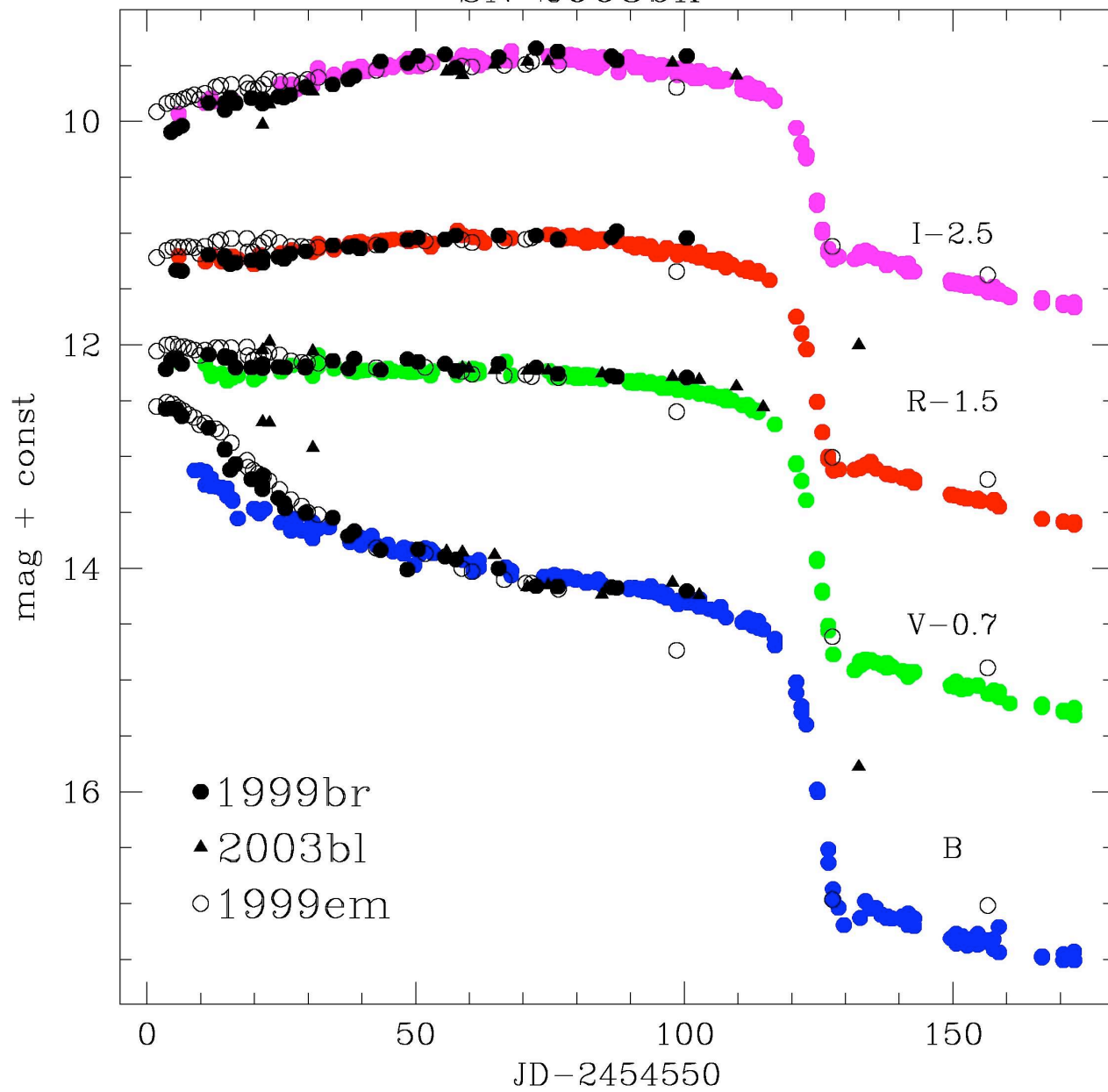
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We use the 10% chilean time
on four of the PROMPTs



Diameter = 40 cm
Pixel scale = 0.6 "/pix
FoW = 10'x10'
Read out time = 9 sec
Mag lim ~ 18.0 in 80 sec
Located at CTIO

SN 2008bk



Radioactive decay

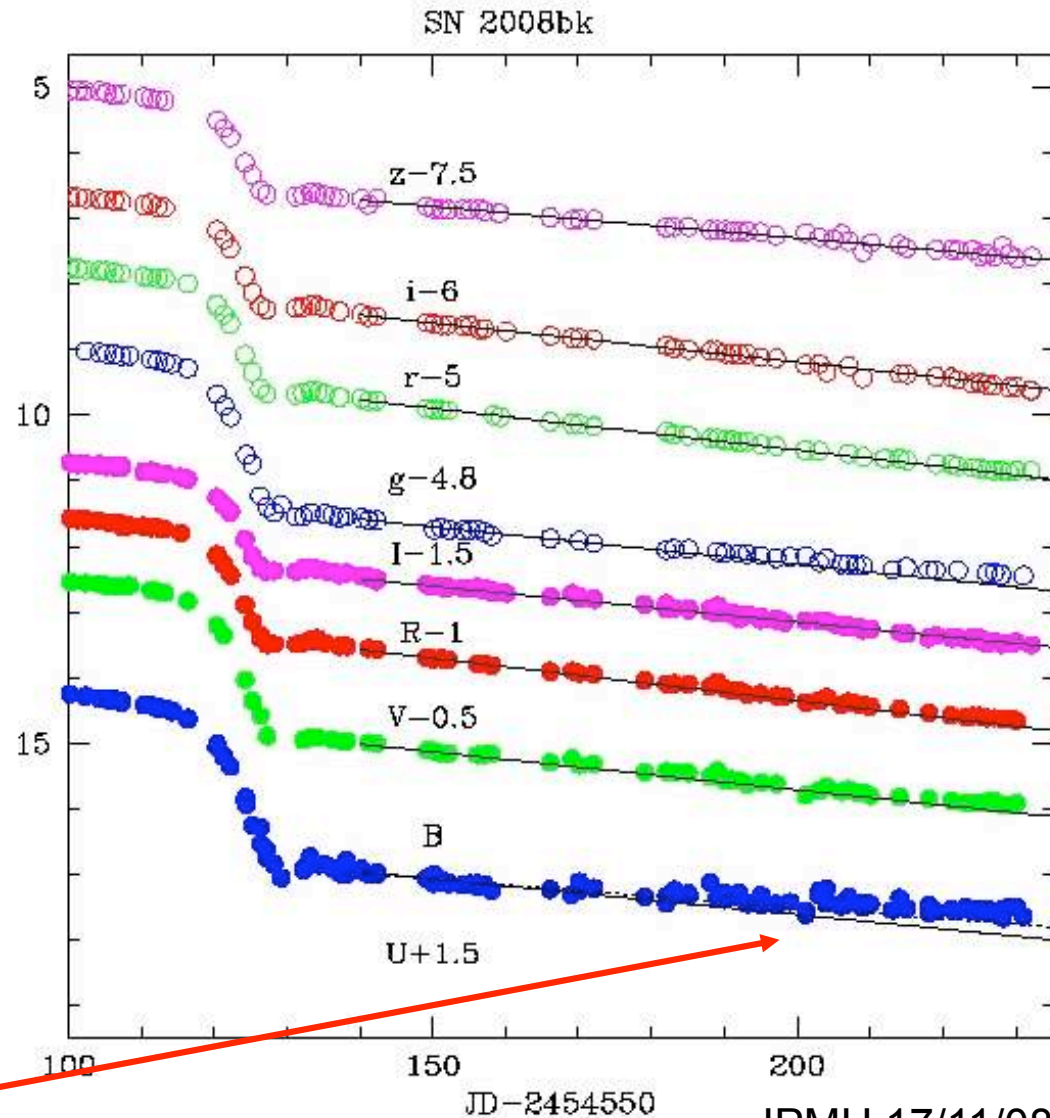
Fitted between 140 and 180 days

$B = 1.09 \pm 0.11$ mag/100d
 $V = 1.16 \pm 0.06$ mag/100d
 $R = 1.30 \pm 0.04$ mag/100d
 $I = 1.09 \pm 0.05$ mag/100d
 $g = 1.15 \pm 0.06$ mag/100d
 $r = 1.27 \pm 0.03$
 $i = 1.19 \pm 0.04$
 $z = 0.96 \pm 0.07$

$^{56}\text{Co} = 0.98$ mag/100d

Fitted between 180 and 240 days

$B = 0.57 \pm 0.10$ mag/100d
 $g = 0.87 \pm 0.04$ mag/100d



background contamination ?

Reddening

1997D

no NaID

1999br

$A_V=0.25$ (Dessart)

$A_V=0.94$ (Olivares)

No NaID

2003Z

no NaID

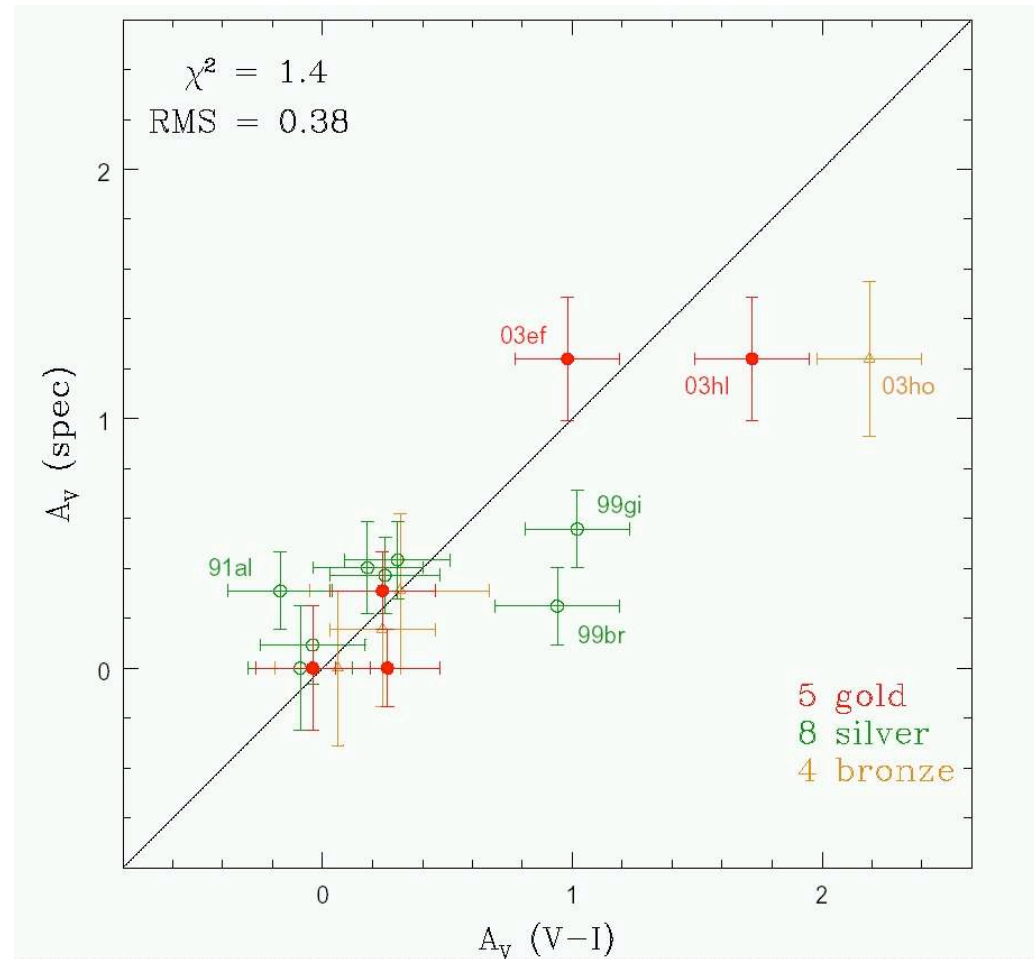
2005cs

NaID ?

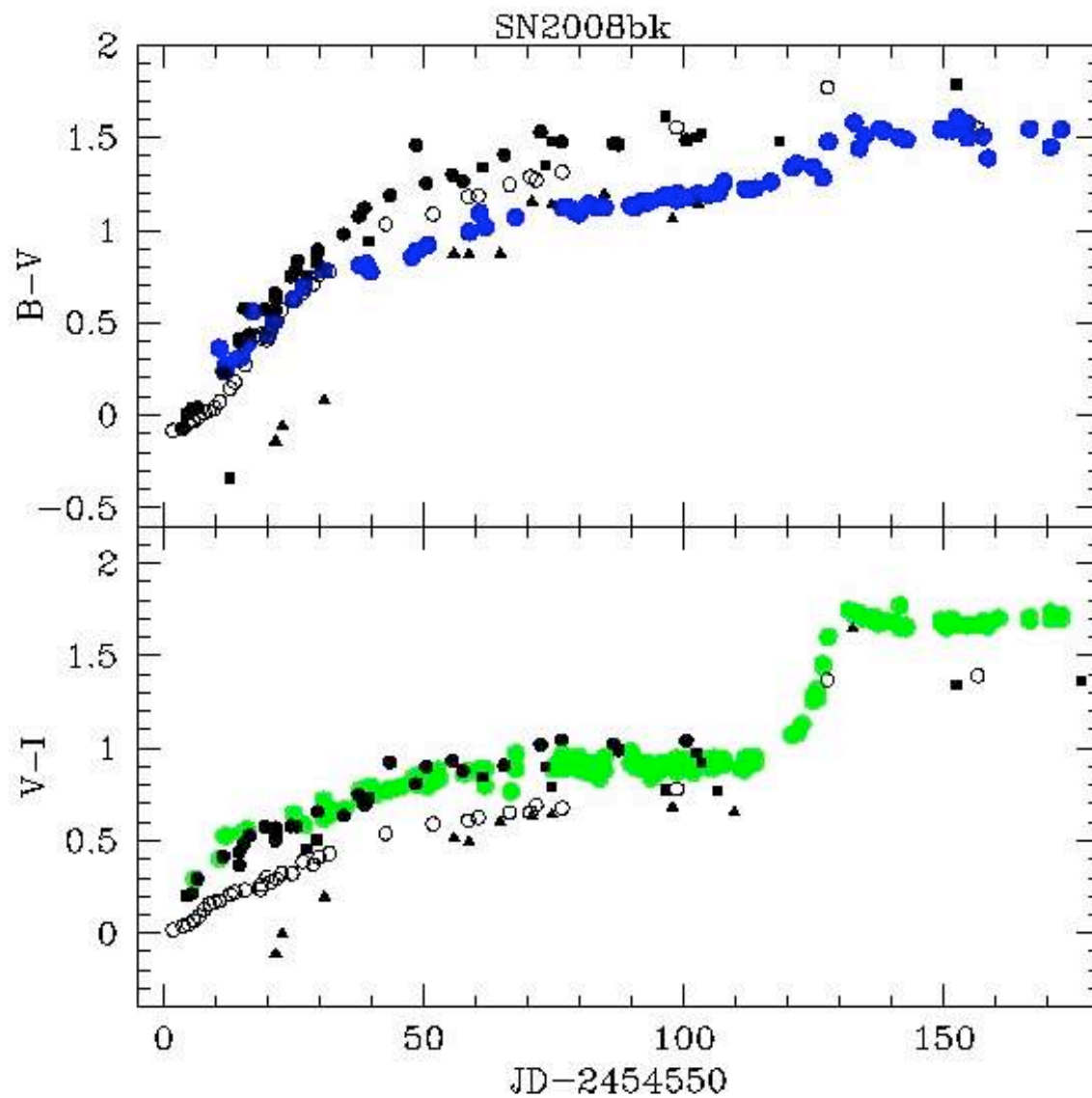
$A_V=0.37$ (Bresolin 2004)

2008bk

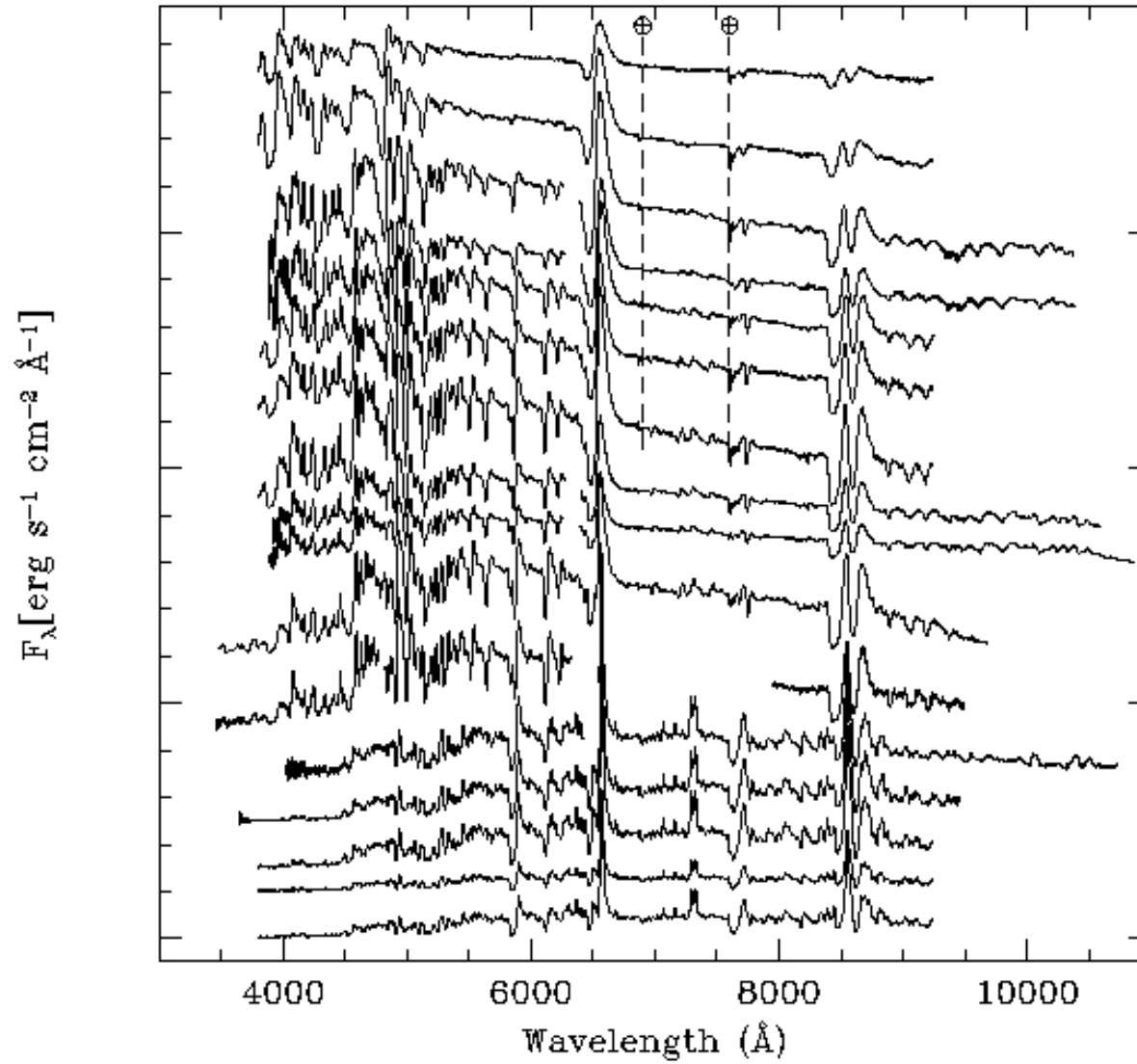
no NaID



Color evolution



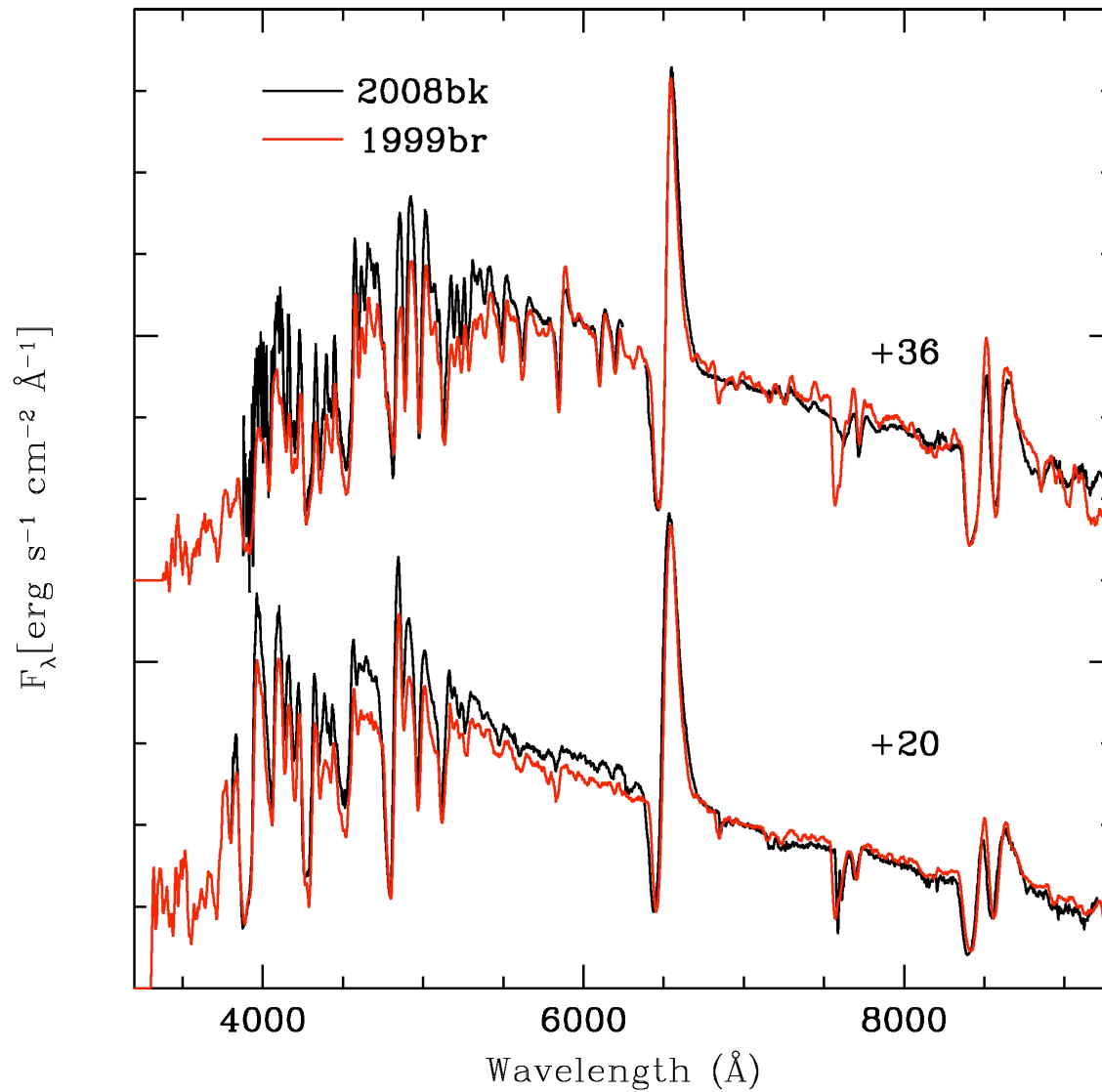
Spectroscopic evolution



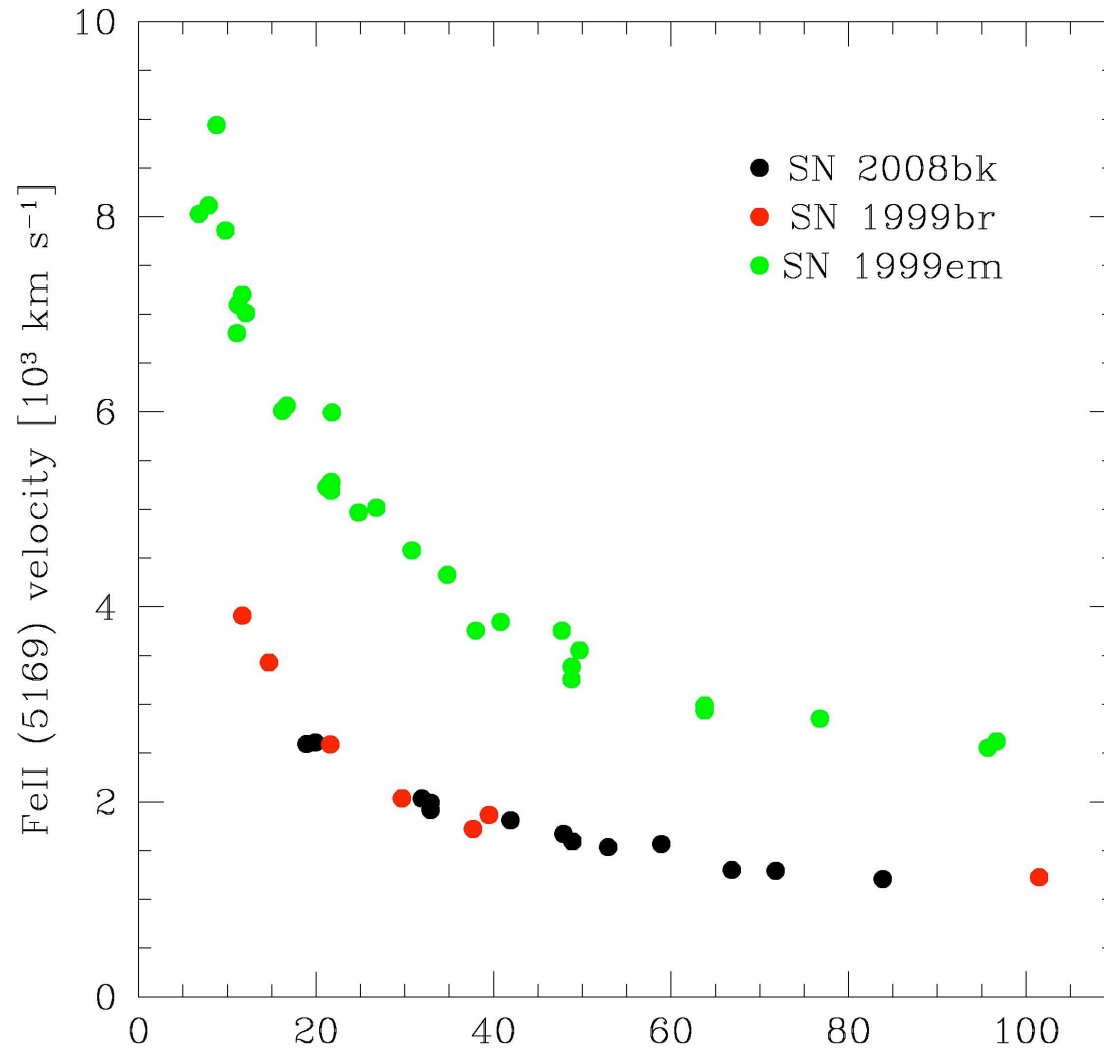
Also IR spectra

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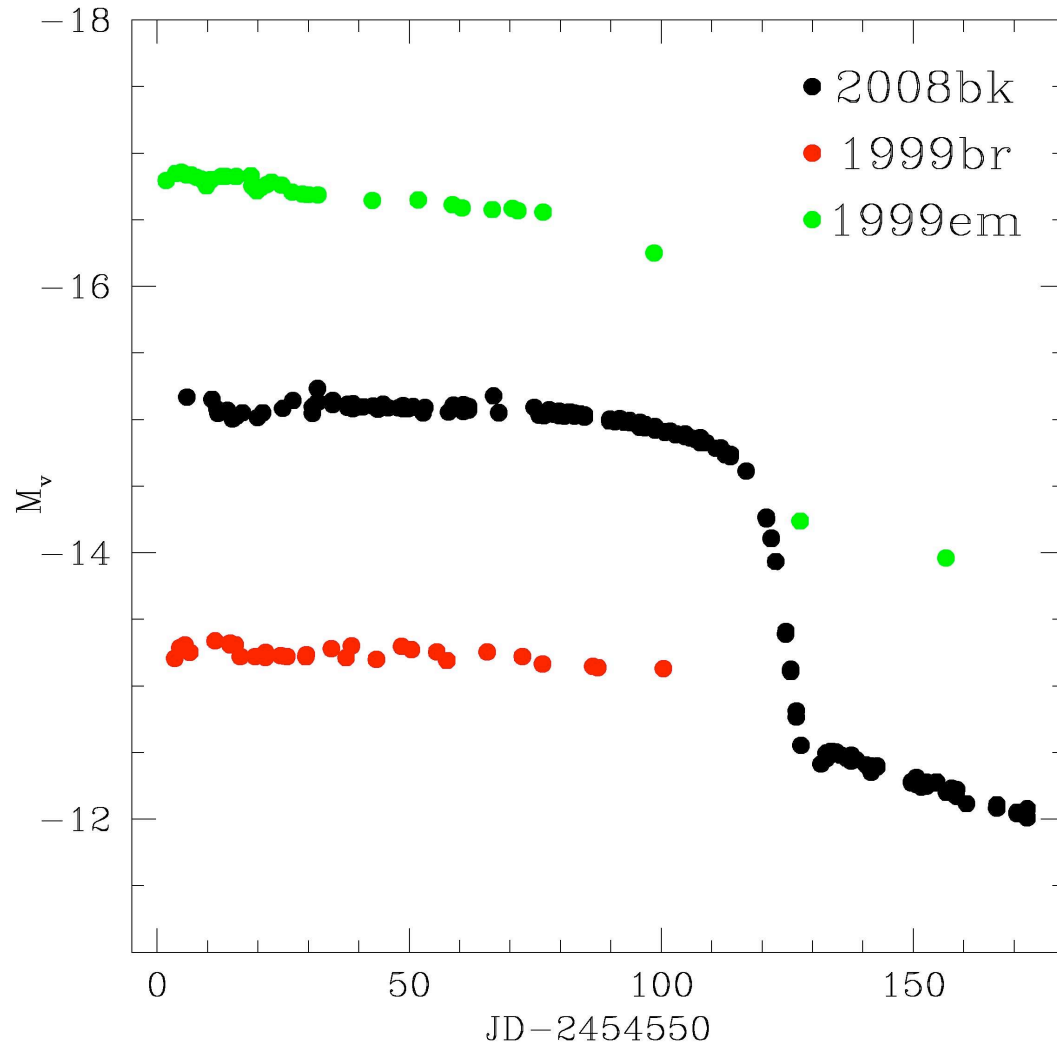
Spectra comparison



Expansion velocity



Absolute Magnitude



Distance

NGC 7793:

27.96 ± 0.28 (Karachentsev 2003)

28.01 (Tully fisher LEDA)

? (Cepheid, Araucaria project)

NGC 4900:

14.1 ± 2.6 Mpc (LEDA)

NGC 1637:

11.7 ± 1 Mpc (Leonard 2003)

