Results of the spring ’02 campaign with ESI

Grégory Sainton

sainton@in2p3.fr

LPNHE - Universités Paris VI & VII

4 place Jussieu

75252 Paris Cedex 05

Supernova Cosmology Project

Spring 2002 campaign with ESI

http://panisse.lbl.gov/collab/data/spec

⇒ Allocated times : 3 nights in April and 3 in May.

⇒ 6 candidates were pointed, 1 was unusable (nothing on the raw) :

⇒ OBSERVING CONDITIONS : **Poor**, Nights of May were lost !

- Candidates from CHFT
  - C02-000 : AssuranceTourix
  - C02-008 : Abraracourcix
- Candidates from Subaru
  - S02-016
  - S02-035
  - S02-049

Supernova Cosmology Project

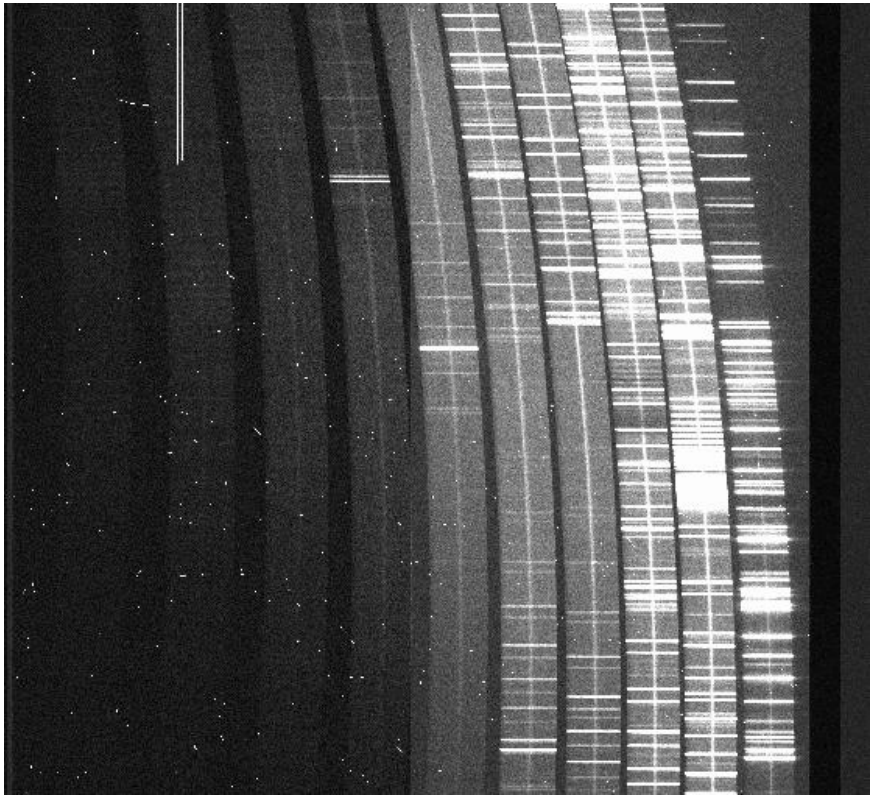
Tools For The Data Reduction (1/2)

IDL : `esi_red.pro` developed by Greg^{LBL}.
This program performs :

- Overscan/bias substraction (correction of level of the two amplifiers).
- Flat-fielding (complete task (fit the profile ...) or just the final division by the normalized flat file).
- Cosmics rejection (Using a discrete Laplacian technique - `Astro-ph/01080003`).

Supernova Cosmology Project

One focus on ESI_RED.PRO

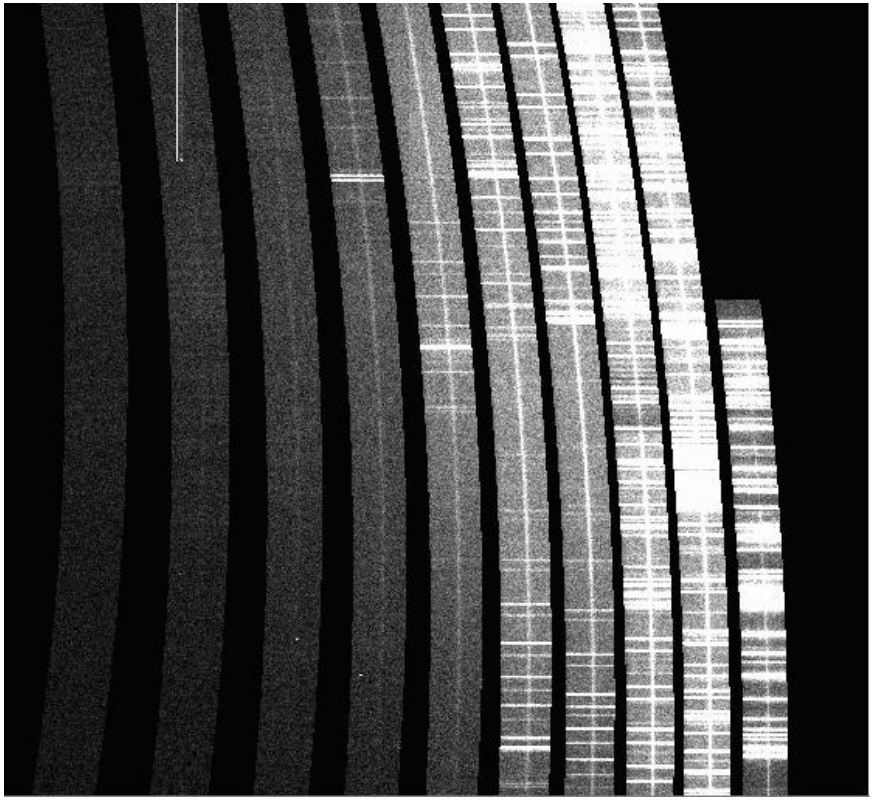


⇐ BEFORE

Supernova Cosmology Project

One focus on ESI_RED.PRO

AFTER $\Rightarrow$



Supernova Cosmology Project

Tools For The Data Reduction (2/2)

IRAF with `noao.imred.echelle` package
↪ tasks developed by Lifan

- Wavelength calibration relation, dead columns removal.
- `esiripp.cl`
  - Using the wavelength calibration (`dispcor`).
  - Fit of the continuum on the standard star (`continuum`).
  - Combination of the 10 orders (using `scombine`).
  - Sensitivity function determination (`standard` & `sensfunc`).
- `esical.cl`
  - Using the wavelength calibration.
  - Flux calibration (using `calibrate`).

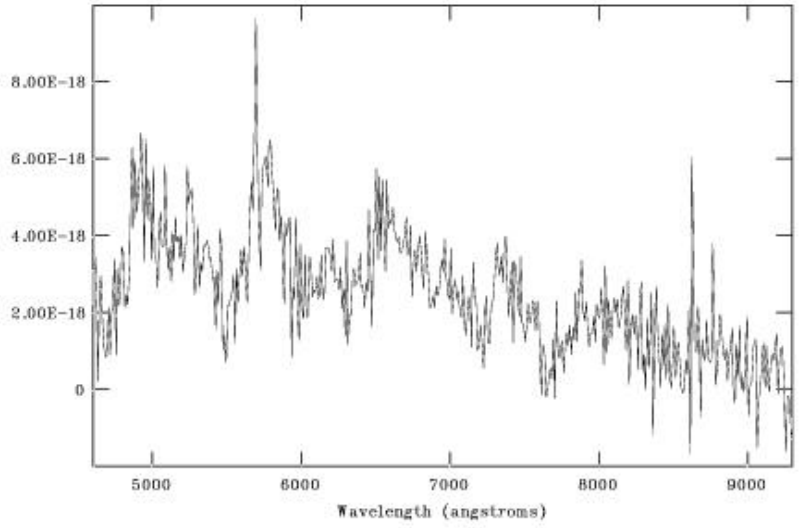
Supernova Cosmology Project

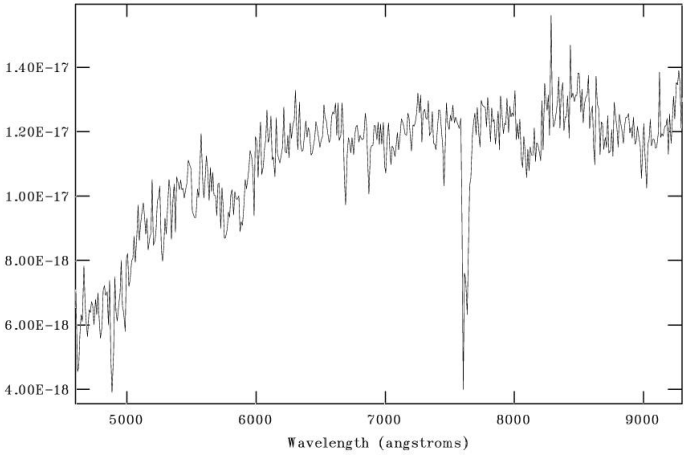
Tools For The Analysis

- Template matching program: Program which minimize a χ^2 between the spectrum of your object and an another known SN + template of Gal. You can take into account the extinction of the galaxy (Lifan's talk).
- Your eyes and our calculator to find some features of SN or Galaxy.
- Last chance, your imagination!!!

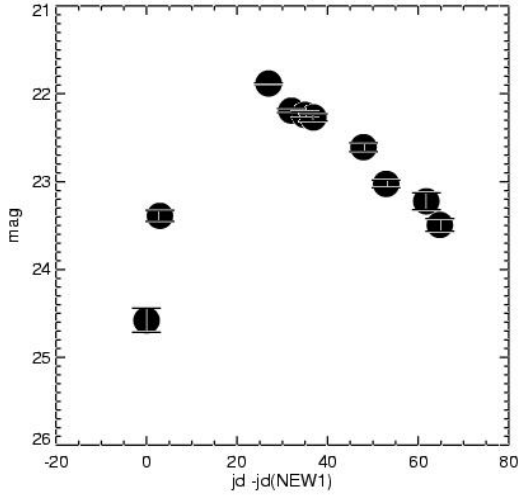
Supernova Cosmology Project

C02-000 : Assurancetourix (FINAL)



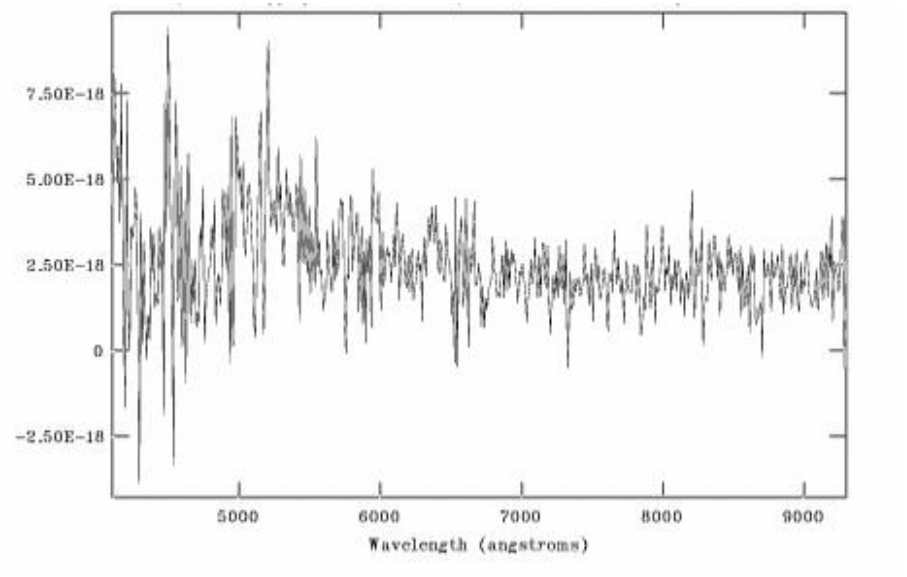


- Type : Ia
- z from gal.: -
- z from object : 0.26
- Phase : +8/+9 (agreement with the light curve)

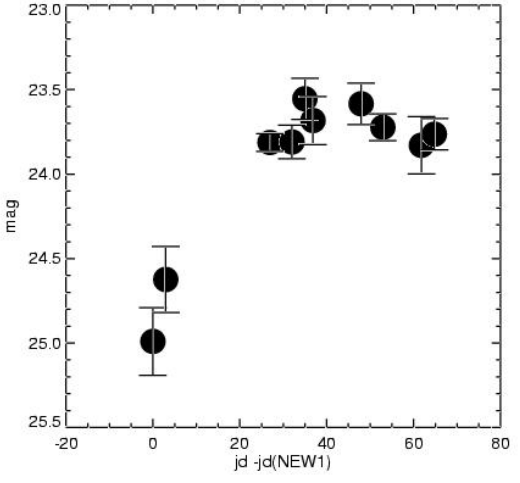


Supernova Cosmology Project

C02-008 : Abraracourcix (FINAL)

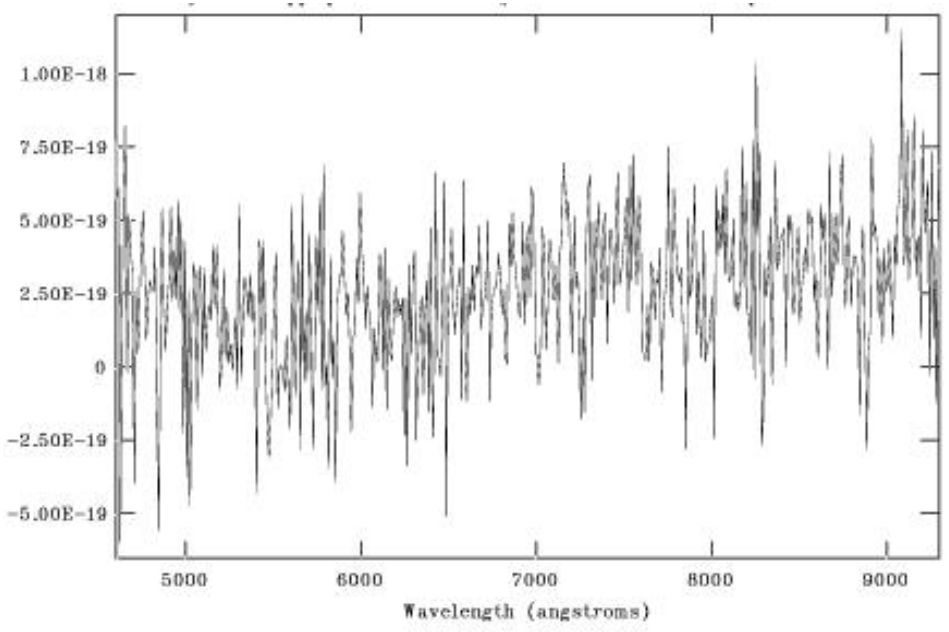


- Type : SN?
- z from gal : -
- z from object : 0.27
- Phase : -3;-4 days
- WHERE IS Si @ 6100 Å
- Weird light curve !



Supernova Cosmology Project

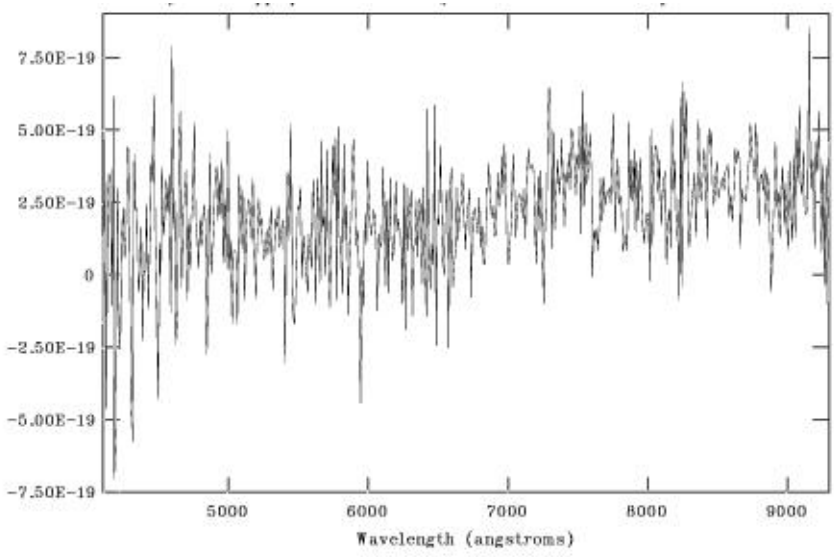
S02-016 (PRELIMINARY RESULT)



- Type : Ia ?
- z from gal. : 0.56
  (with OII, OIII, Hb, Hg)
- z from object : -
- Phase : ?

Supernova Cosmology Project

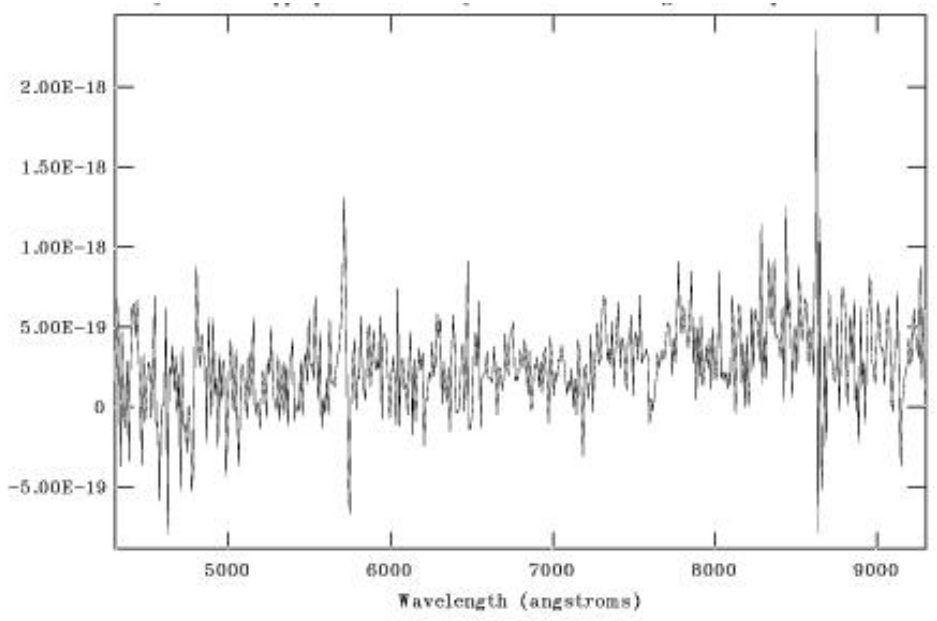
S02-035 (PRELIMINARY RESULT)



- Type : ?
- z by gal. : -
- z by object : 1.41 ??
- Phase : max?

Supernova Cosmology Project

S02-049 (PRELIMINARY RESULT)



- Type : Ia?
- z from gal. : -
- z from object : 0.88?
- Phase : max ?
- Re-observed @ Gemini.

Supernova Cosmology Project

Summary of the results

Name	type	z-Gal	z-SN	phase
C02-000	Ia	-	0.26	+8/+9
C02-008	Ia?	-	0.27	-3/-4
S02-016	Ia?	0.56	?	?
S02-035	?	-	1.41?	?
S02-049	Ia?	0.88?	-	max

→ S02-049 has been reobserved at Subaru

Supernova Cosmology Project

Conclusion

Almost final

- Results
  - Poor weather.
  - Only one sure type Ia supernova.
- Reduction
  - Better extraction ?
  - Taking into account the sky lines distortions ?
  - Substraction of galaxy spectrum ?
- Analysis

  Possible improvments in the template matching code (Lifan's talk)?

Other use of these spectra besides SN identification ?

Supernova Cosmology Project