J/ApJ/825/L22 BVRI LCs of type Ib supernova iPTF13bvn (Folatelli+, 2016)

Disappearance of the progenitor of supernova iPTF13bvn.
Folatelli G., Van Dyk S.D., Kuncarayakti H., Maeda K., Bersten M.C.,
Nomoto K., Pignata G., Hamuy M., Quimby R.M., Zheng W., Filippenko A.V.,
Clubb K.I., Smith N., Elias-Rosa N., Foley R.J., Miller A.A.
<Astrophys. J., 825, L22-L22 (2016)>
=2016ApJ...825L..22F (SIMBAD/NED BibCode)

ADC_Keywords: Supernovae ; Photometry, UBVRI

Keywords: galaxies: individual: NGC 5806; stars: evolution; supernovae: general;
supernovae: individual: iPTF13bvn

Abstract:
Supernova (SN) iPTF13bvn in NGC 5806 was the first Type Ib SN to have been tentatively associated with a progenitor in pre-explosion images. We performed deep ultraviolet (UV) and optical Hubble Space Telescope observations of the SN site ~740 days after explosion. We detect an object in the optical bands that is fainter than the pre-explosion object. This dimming is likely not produced by dust absorption in the ejecta; thus, our finding confirms the connection of the progenitor candidate with the SN. The object in our data is likely dominated by the fading SN, implying that the pre-SN flux is mostly due to the progenitor. We compare our revised pre-SN photometry with previously proposed models. Although binary progenitors are favored, models need to be refined. In particular, to comply with our deep UV detection limit, any companion star must be less luminous than a late-O star or substantially obscured by newly formed dust. A definitive progenitor characterization will require further observations to disentangle the contribution of a much fainter SN and its environment.

Description:
We obtained deep imaging of the field of iPTF13bvn ~740 days after explosion using HST through Cycle 22 programs GO-13684 and GO-13822. Program GO-13684 was executed between 2015 June 26.37 and 26.60 (UT dates are used herein) with the Wide Field Camera 3 (WFC3) UVIS channel. Program GO-13822 comprised observations obtained on 2015 June 30.63 with WFC3/UVIS (F225W filter) and on June 30.90 UT with the Advanced Camera for Surveys (ACS; F814W filter).
The supernova (SN) location in the pre- and post-explosion images was found by aligning them relative to a F555W image obtained through program GO-12888 with WFC3/UVIS on 2013 September 2.37 when the SN was still very bright.

We also obtained BVRI imaging of iPTF13bvn until ~280 days with the Katzman Automatic Imaging Telescope (KAIT) and the 1m Nickel telescope at Lick Observatory (see table 3). Apparent magnitudes were first measured in the KAIT4 natural system and then transformed to the standard system using local calibrators and color terms as given in Table 4 of Ganeshalingam et al. (2010, J/ApJS/190/418).

Objects:

RA (ICRS)	DE	Designation(s)
15 00 00.15	+01 52 53.2	iPTF13bvn = iPTF 13bvn

File Summary:

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
table3.dat	68	42	KAIT and Nickel Photometry of iPTF13bvn

See also:
J/A+A/580/A142 : SN 2011dh. The first two years (Ergon+, 2015)
J/A+A/574/A60 : Light curve templates of SNe Ib/c from SDSS (Taddia+, 2015)
J/A+A/573/A12 : SN1993J spectra 100-500d post-explosion (Jerkstrand+, 2015)
J/A+A/562/A17 : SN 2011dh - The first 100 days (Ergon+, 2014)
J/MNRAS/436/774 : Core collapse supernovae (type Ibc) (Eldridge+, 2013)
J/A+A/558/A131 : Model spectra of hot stars at the pre-SN stage (Groh+, 2013)
J/ApJ/741/97 : Light curves of Ibc supernovae (Drout+, 2011)
J/ApJS/190/418 : Light curves for 165 SNe (Ganeshalingam+, 2010)

Byte-by-byte Description of file: table3.dat

Bytes	Format	Units	Label	Explanations
1- 8	F8.2	d	MJD	Modified Julian date
10- 15	F6.2	d	Phase	Rest-frame phase (1)
17	A1	---	l_Bmag	Limit flag on Bmag

19- 23	F5.2	mag	Bmag	[15.8/21.7] Apparent B band magnitude
25- 28	F4.2	mag	e_Bmag	[0.05/0.5]? One sigma uncertainty in Bmag
30- 34	F5.2	mag	Vmag	[15.2/21]? Apparent V band magnitude
36- 39	F4.2	mag	e_Vmag	[0.02/0.2]? One sigma uncertainty in Vmag
41- 45	F5.2	mag	Rmag	[14.9/20.7]? Apparent R band magnitude
47- 50	F4.2	mag	e_Rmag	[0.01/0.2]? One sigma uncertainty in Rmag
52- 56	F5.2	mag	Imag	[14.8/20.5]? Apparent I band magnitude
58- 61	F4.2	mag	e_Imag	[0.01/0.2]? One sigma uncertainty in Imag
63- 68	A6	---	Tel	Telescope name (2)

Note (1): In days after the explosion (JD=2456459.24).

Note (2): Telescope as follows:
KAIT = Katzman Automatic Imaging Telescope.
Nickel = The 1m Nickel telescope at Lick Observatory.

History:
From electronic version of the journal

(End) Prepared by [AAS], Emmanuelle Perret [CDS] 02-Sep-2016

*The document above follows the rules of the Standard Description for Astronomical Catalogues; from this documentation it is possible to generate **f77** program to load files into arrays or line by line*