This dataset contains the images of the comet ISON observed on October 01 2013 and a standard Landolt star field SA95-41 observed on October 03 2013 by 2.34-m HCT telescope, Hanle, India. The dataset contains the following subdirectories with following data in the directories:

Imaging/October01:

Raw/:

Comet images:	**filter**	**exposure (sec)**
wj010098.fits	R	300.000
wj010099.fits	V	600.000
wj010100.fits	V	900.000
Biases:		
wa220001.fits	"1 Free"	0.000
wa220017.fits	"1 Free"	0.000
wa220027.fits	"1 Free"	0.000
wi030017.fits	"1 Free"	0.000
wi030028.fits	"1 Free"	0.000
wi030051.fits	"1 Free"	0.000
wi080001.fits	"1 Free"	0.000
wi080055.fits	"1 Free"	0.000
wj010062.fits	"1 Free"	0.000
wj010095.fits	"1 Free"	0.000
Sky flats:		
wa220012.fits	R	4.000
wj030068.fits	R	30.000
wj030069.fits	R	20.000
wj030070.fits	R	10.000
wi290008.fits	V	1.000
wi290009.fits	V	1.500
wi290010.fits	V	2.000
wi290079.fits	V	3.000
wi290080.fits	V	1.500
wi290081.fits	V	1.000
wj030074.fits	V	1.500
wj030075.fits	V	1.000
wj030076.fits	V	0.900

Calibration/:

1o_zero.fits	Master Bias
1o_flatr.fits	Master Flat in R filter
1o_flatv.fits	Master Flat in V filter

Processed/:

`cc' - means cosmic ray cleaned, `f' - flat-fielded and `b' – de-biased, `t' – aligned

fbwj010098.fits	R	ccfbwj010098.fits	
fbwj010099.fits	V	ccfbwj010099.fits	tccfbwj010099.fits
fbwj010100.fits	V	ccfbwj010100.fits	tccfbwj010100.fits

Imaging/October03:

Raw/:

Stellar images:	**filter**	**exposure (sec)**
wj030054.fits	"4 Bes R"	10.000
wj030055.fits	"4 Bes R"	30.000
wj030057.fits	"6 Bes B"	100.000
Biases:		
wj030026.fits	"1 Free"	0.000
wj030035.fits	"1 Free"	0.000
wj030042.fits	"1 Free"	0.000
wj030048.fits	"1 Free"	0.000
wj030059.fits	"1 Free"	0.000
Sky flats:		
wj030068.fits	"4 Bes R"	30.000
wj030069.fits	"4 Bes R"	20.000
wj030070.fits	"4 Bes R"	10.000
wj030074.fits	"6 Bes B"	1.500
wj030075.fits	"6 Bes B"	1.000
wj030076.fits	"6 Bes B"	0.900

Calibration/:

3o_zero.fits	Master Bias
3o_zerofit.fits	'noiseless' smoothed Master Bias
3o_flatr.fits	Master Flat in R
3o_flatb.fits	Master Flat in B

Processed/:

`cc' - means cosmic ray cleaned, `f' - flat-fielded and `b' – de-biased

fbwj030054.fits	R	ccfbwj030054.fits
fbwj030055.fits	B	ccfbwj030055.fits
fbwj030057.fits	B	ccfbwj030057.fits

Document/:

preprocessing.cl	-	Preprocessing IRAF code
cosmic_rays.cl	-	IRAF code for cosmic rays removal
October2013_Imaging.pdf	-	This document

HFOSC CCD characteristics and Reduction procedure:

CCD:

Photometric data was obtained on October 01, 2013, using the Himalayan Faint Object Spectrograph and Camera (HFOSC) mounted on the 2.0-m HCT of the Indian Astrophysical Observatory (IAO) of the Indian Institute of Astrophysics (IIA), located at 4500 m above sea level, Hanle, Leh, Ladakh.

HFOSC is equipped with a Thompson CCD of 2048x2048 pixels with a pixel scale of 0.296”/pix and a field of view of ~10x10 arcmin. The readout noise, gain and readout time of the CCD are 4.87 e, 1.22 e/ADU, and 90 sec, respectively.

Reduction Procedure.

At the time of the observations, no sky flat frames in V filter have been taken, therefore we have used the V sky flats from days before and after the observation. Similarly, we had to supplement sky flats in R as only 3 were taken on 01 October. Unfortunately, there was also a mistake during the observation of the comet – the images were supposed to be taken in B filter, and it was written wrongly in the headers as B. Instead, the comet was taken in V filter. But the flats, as well as the standard stellar field were taken in B filter.

Basic reduction was performed by using IRAF-based script that employs IRAF procedure *ccdproc*, and includes trimming the frames to [100:1945,100:1945], *zerocombine* for bias subtraction, and *flatcombine* for flat-fielding. The code creates Master bias frame called Zero.fits, and Master flat frames for each filter: FlatR.fits and FlatV.fits. The code ***preprocessing.cl*** is attached. Cosmic rays were removed using IRAF-based script that employs IRAF task *crmedian*. The code ***cosmic_rays.cl*** is attached.

Alignment.

Images taken in B (2 frames) filter are aligned on the brightest part of the comet (optocentre) using IRAF procedure *imalign*. After debiasing and flat-fielding, we register the images on the brightest part of the comet as if it were a star. Since the images were taken very close in time, the focal length of the telescope did not change and a translation only is required. We find the brightest pixel, or the location of the peak brightness of the coma, using the IRAF task *imexamine* with the command that prints 11x11 grid of pixel values and integer coordinates. These integer coordinates and user-calculated shifts are supplied to the task as the initial estimate for each image of the shift in each axis relative to the reference image. The sense of the shifts is such that: Xshift=Xref-Xin and Yshift=Yref-Yin. The task *imalign* will

cause the image to be shifted such that the object is positioned at the same pixel location as in the reference. The IRAF task *imalign* measures the *x* and *y* shifts between a list of input images and a reference image, registers the input images to the reference image using the computed shifts, and trims the input images to a common overlap region (if required). The basic operation of the task is to find centres for the list of registration objects or features in the coordinate frame of each image and then to subtract the corresponding centres found in the reference image. In the final centering, all the sources are recentred in each image using the initial estimate of the relative shift for each image. The centroiding algorithm used here is *centroid, which* computes the intensity weighted mean and mean error of the centering box *x* and *y* marginal distributions using points in the marginal arrays above (below) the minimum (maximum) data pixel plus (minus) a threshold value. The centroid is calculated with respect to the level specified by background. The images are shifted using the *imshift* of the task *imalign* with `linear' interpolation function, where output image grey levels are determined by interpolating in the input image at the positions of the shifted output pixels. Note that *imshift* task does not calculate the shifts; this is done by the centroiding algorithm of the task *imalign*, which is not limited by the initial integer inputs and can calculate sub-pixels shifts.