

Quality control monitoring for WFCAM



Marco Riello
CASU - Cambridge, UK

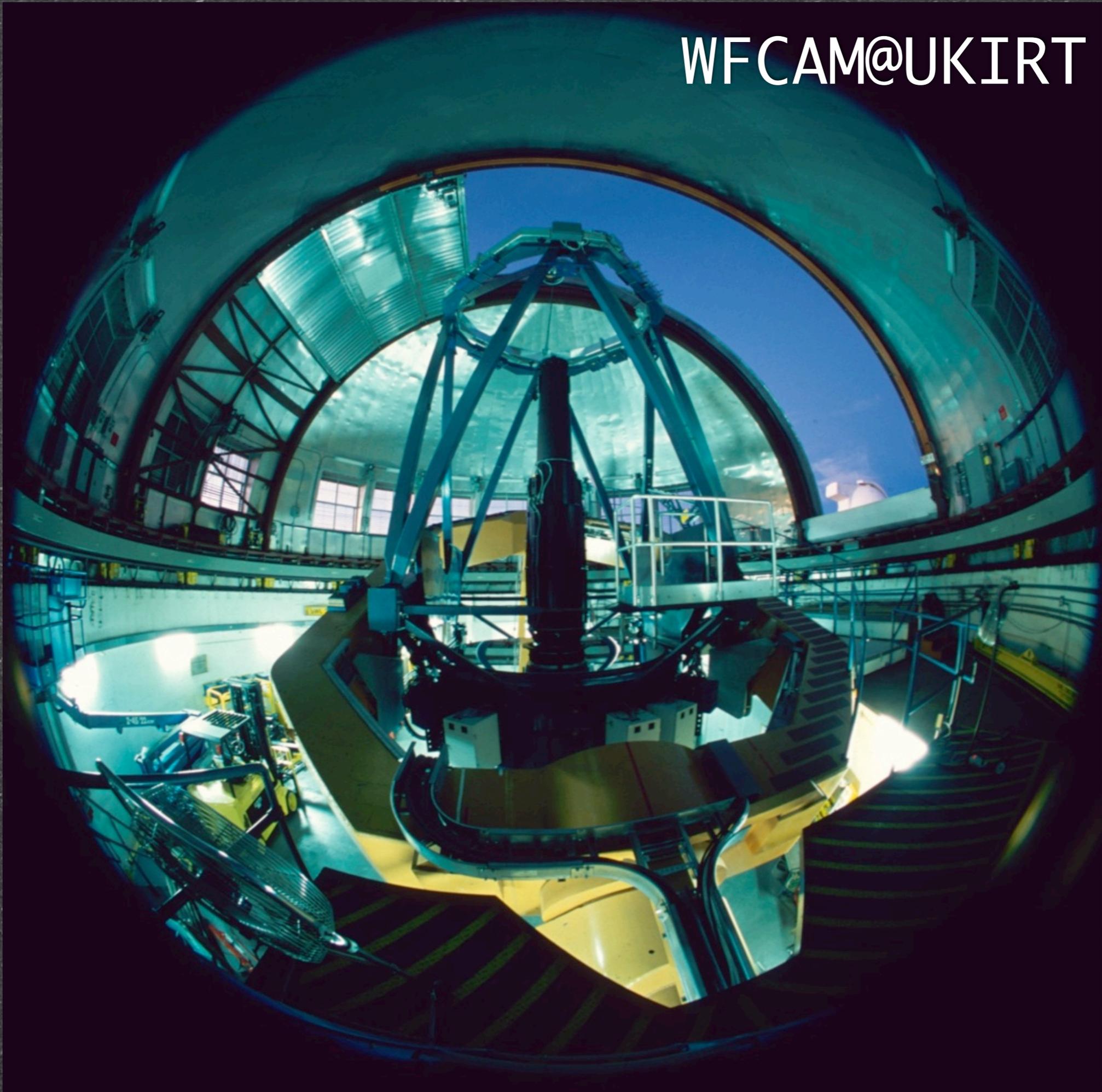


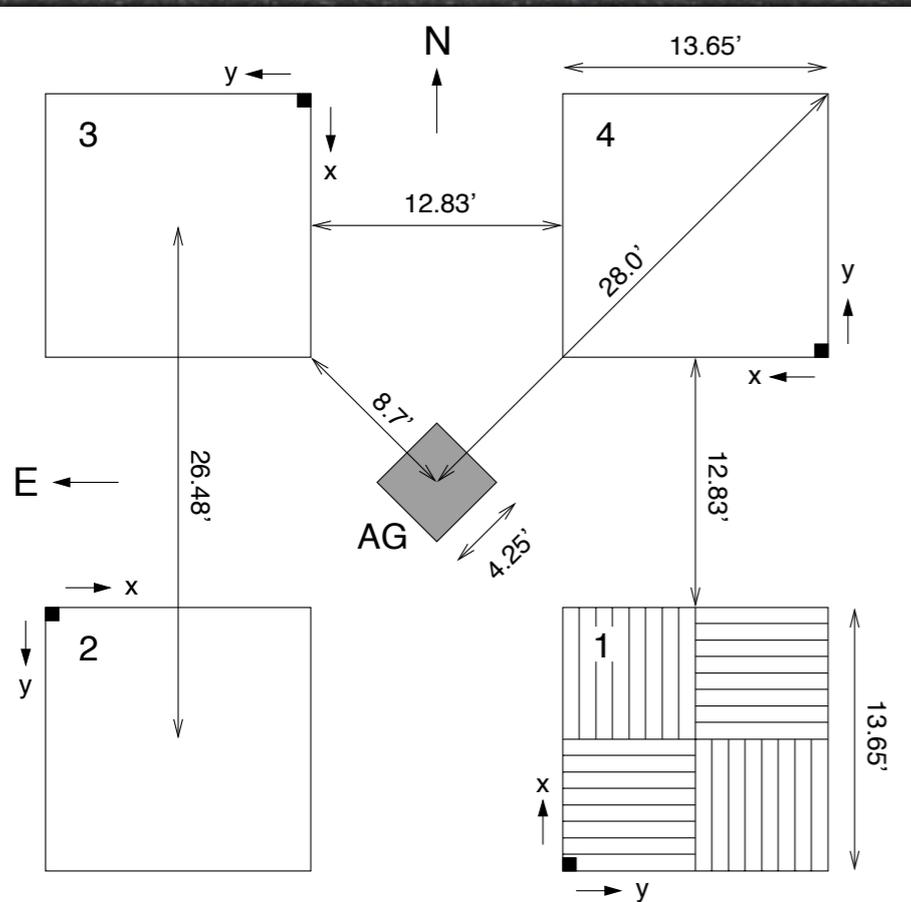
mriello@ast.cam.ac.uk

Talk outline

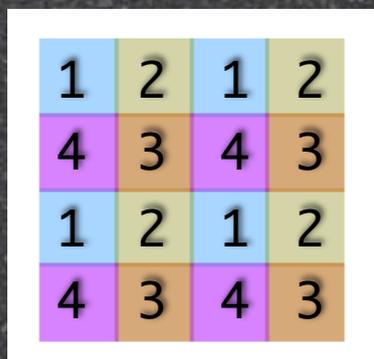
- WFCAM overview
- WFCAM operations at CASU
- Quality control
- Mauna Kea NIR sky

WFCAM@UKIRT

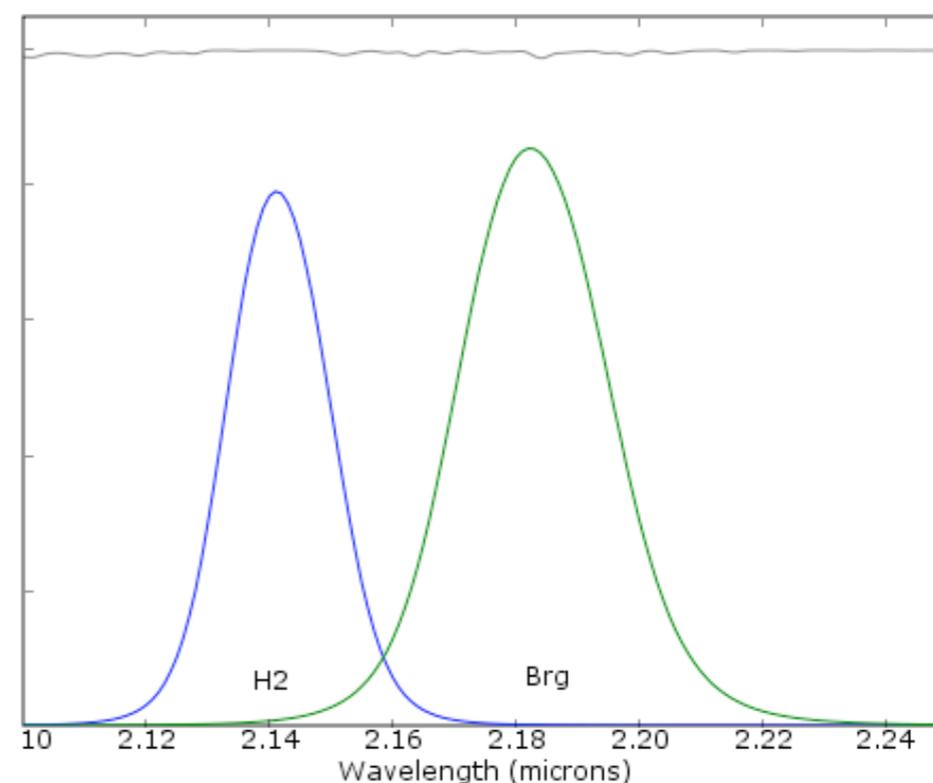
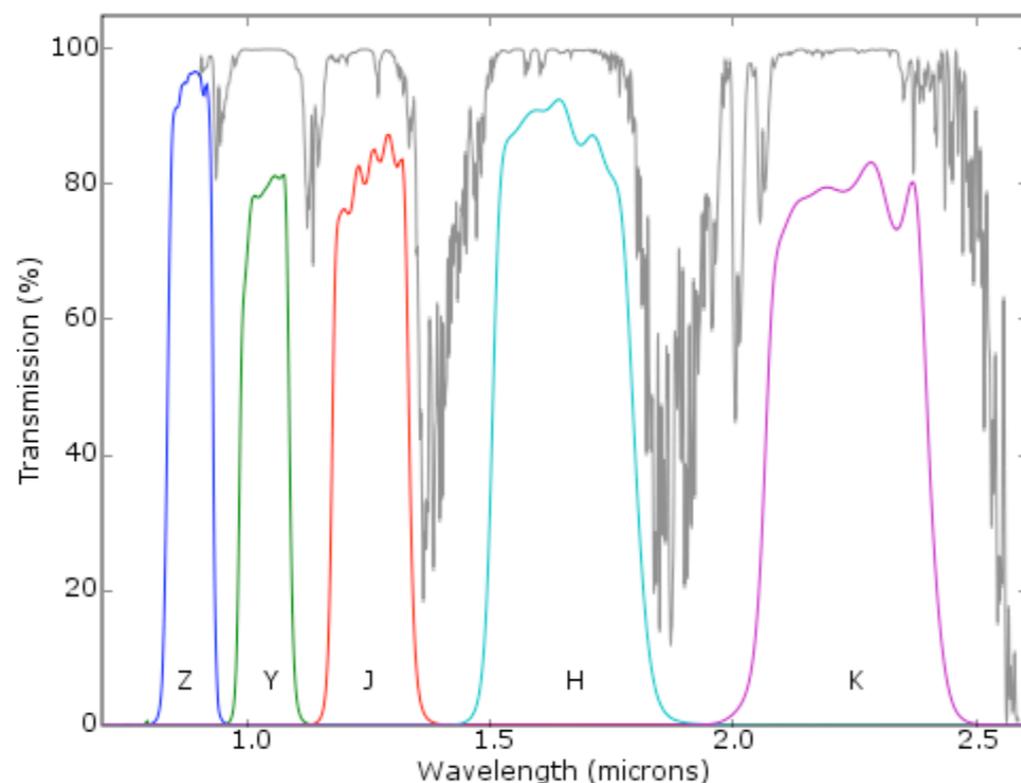




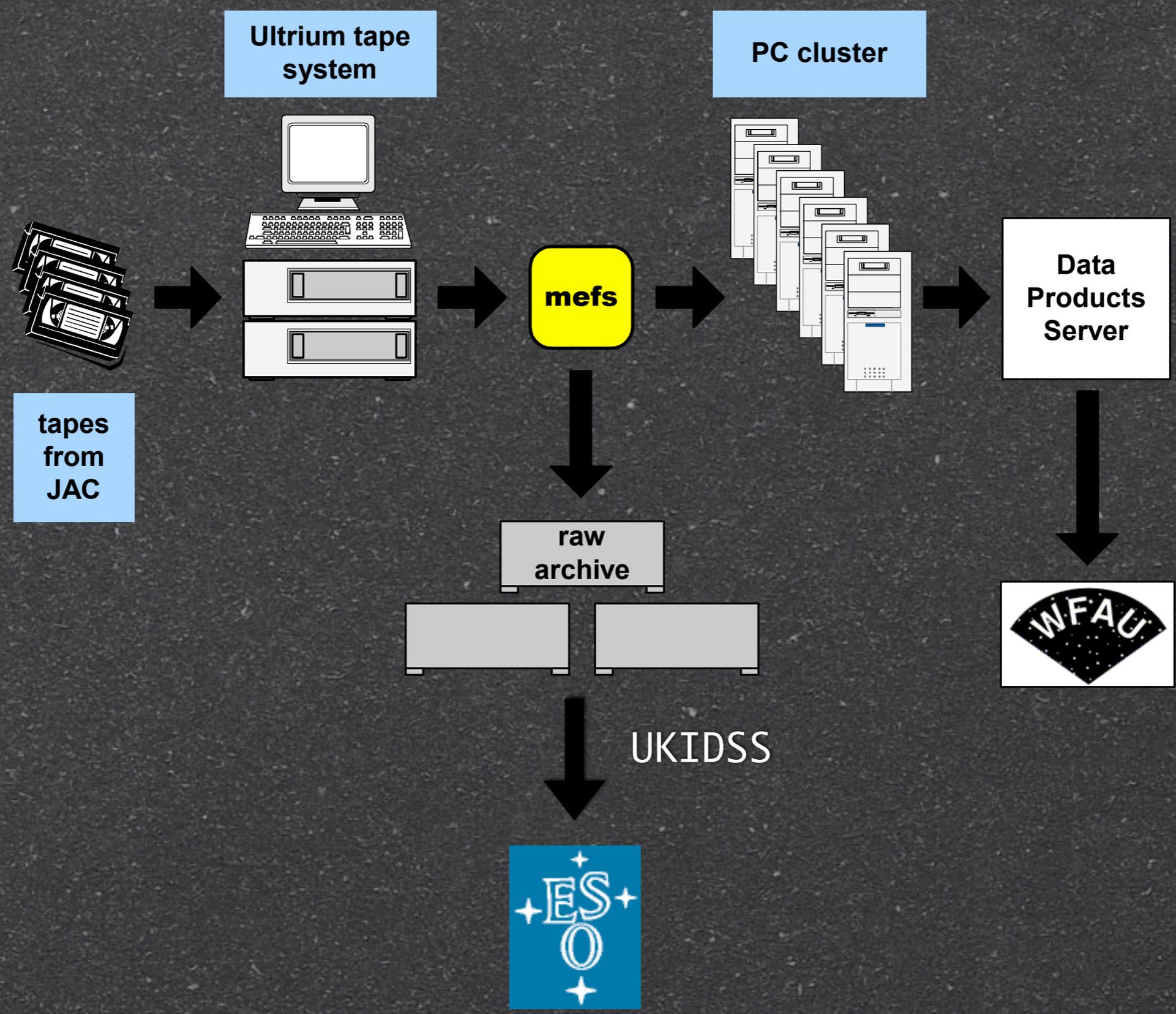
Detectors	4 Rockwell-Hawaii-II (HgCdTe 2K x 2k)
Scale	0.4 arcsec/pix
F.O.V.	0.8 sq.deg.
Filter set	Z Y J H K - H ₂ BrY
Data Volume	~140 Gb/night



Tile



Data Flow



Operations Summary

Operations Summary

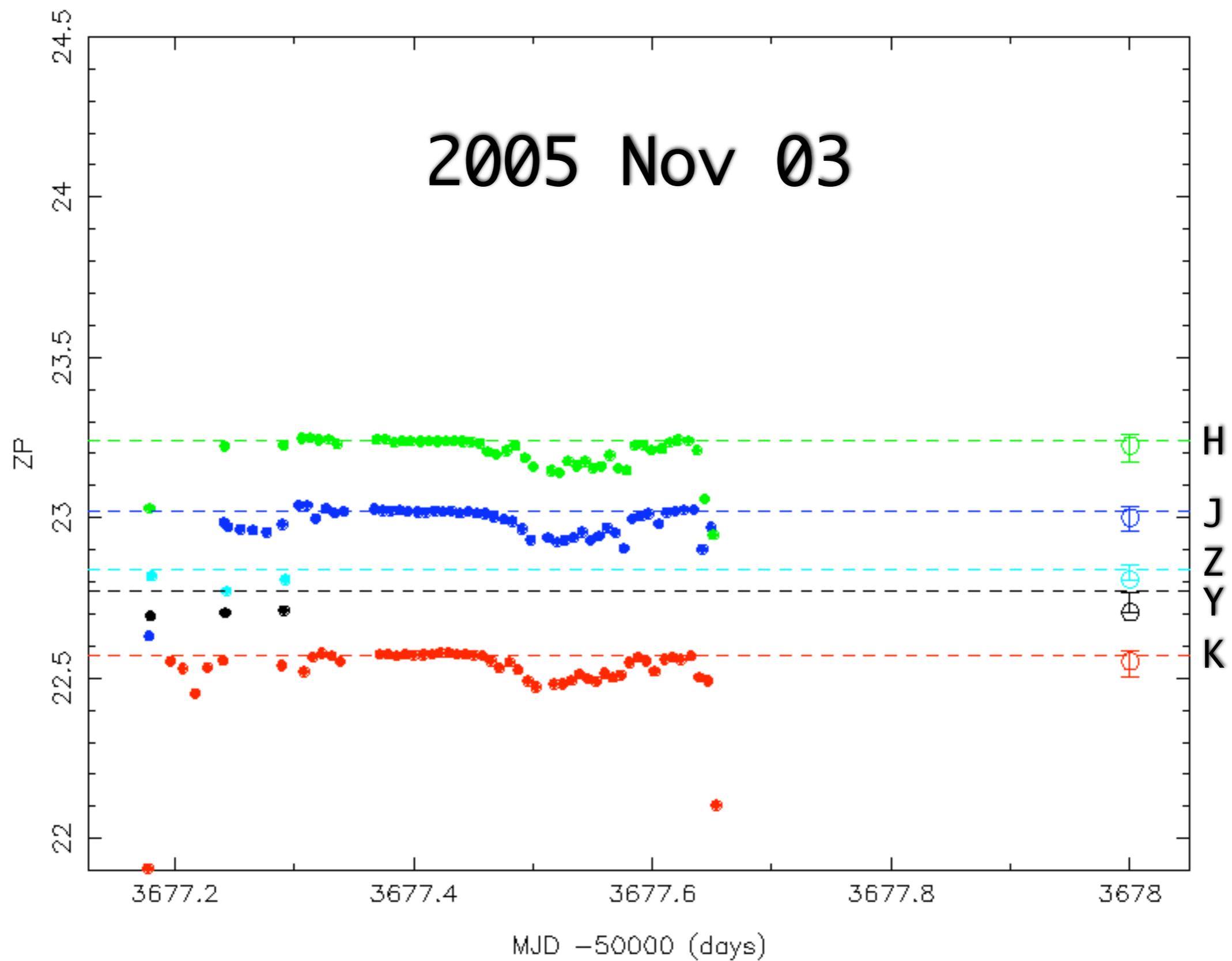
- 3 semesters of operations (05A, 05B, 06A):
 - 329 nights, ~30 Tb raw, ~70 Tb reduced
 - ~400000 raw files transferred to the ESO archive
 - 600000+ raw files, ~2.5m after processing
 - 2100 raw images/night [1500,2500] (inc. cal.)
 - 765m detected objects
 - Effort required: ~1 FTE

Operations Summary

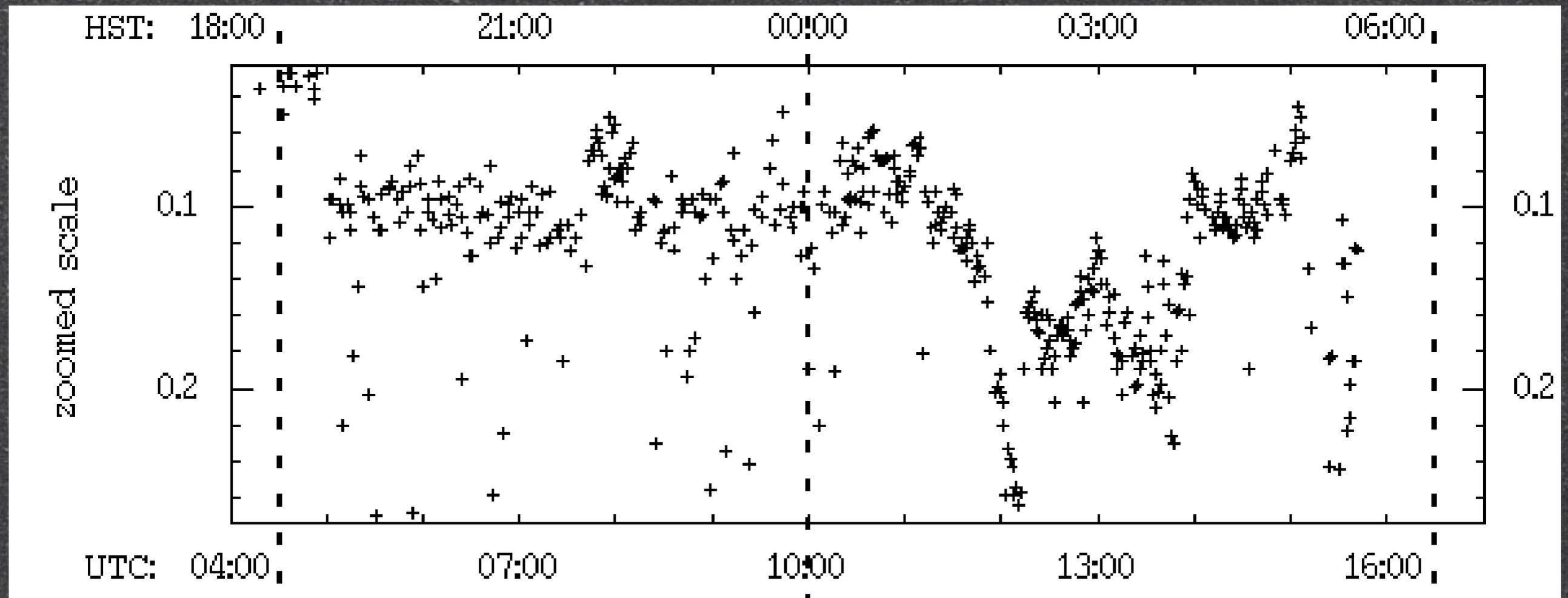
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- Processed data:
 - Images (stacked/interleaved) + confidence maps
 - Source catalogues (FITS binary tables, 80 cols.)
 - QC measures (FITS headers) + summary plots/ascii

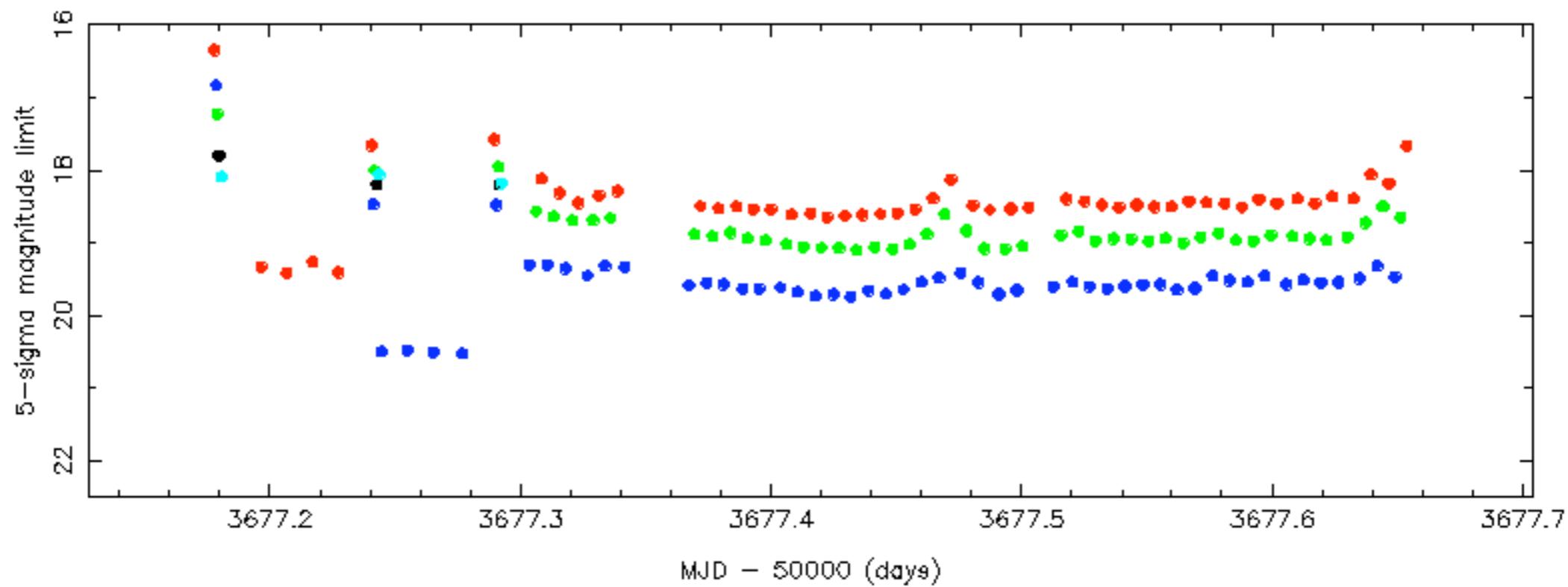
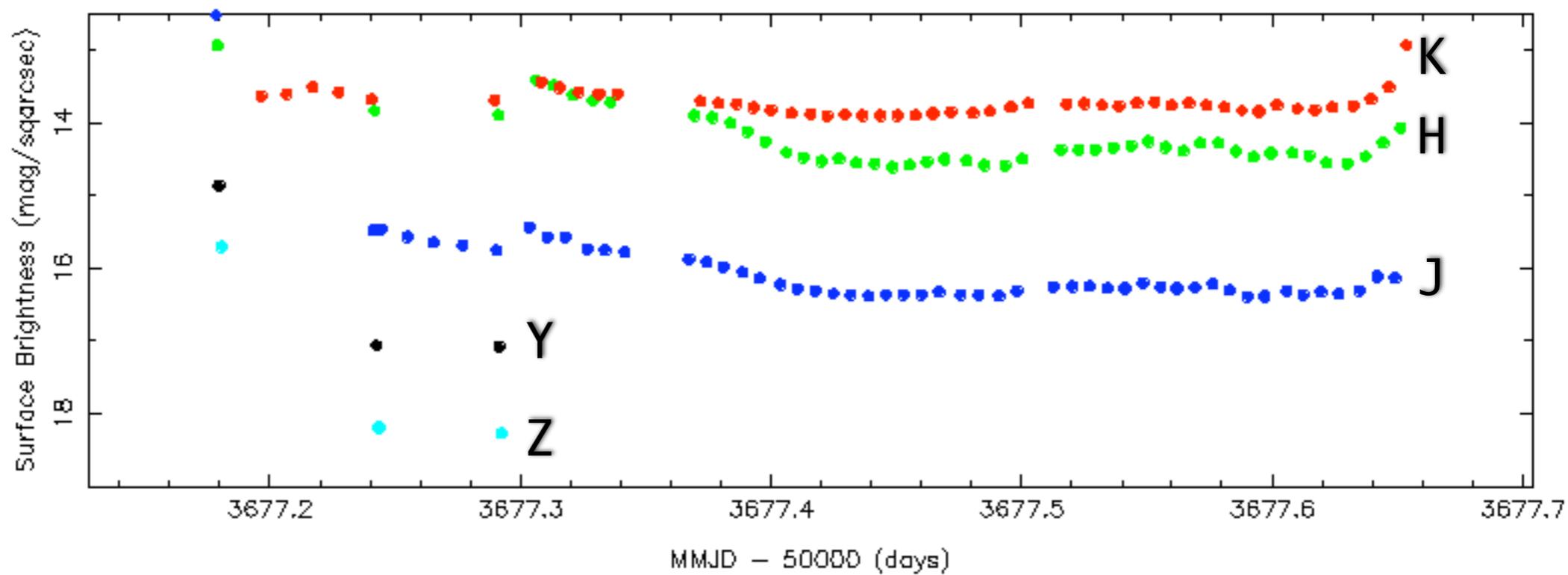
Photometric zero-points

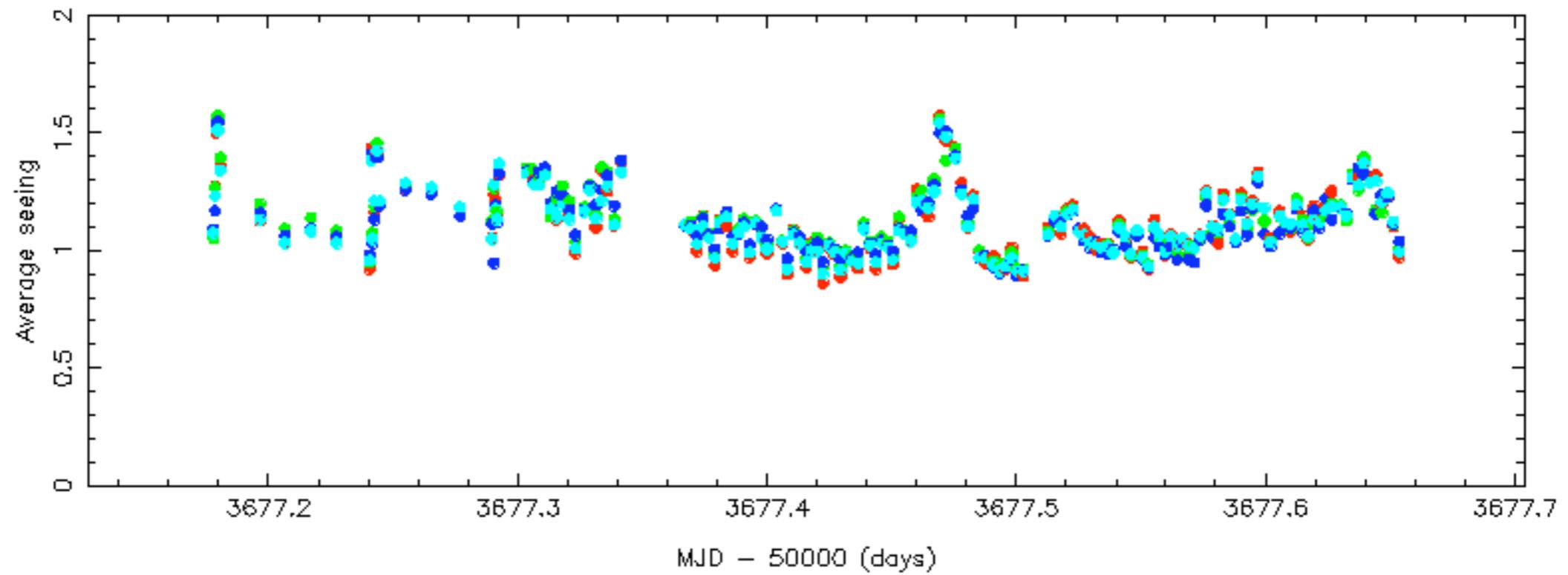
2005 Nov 03



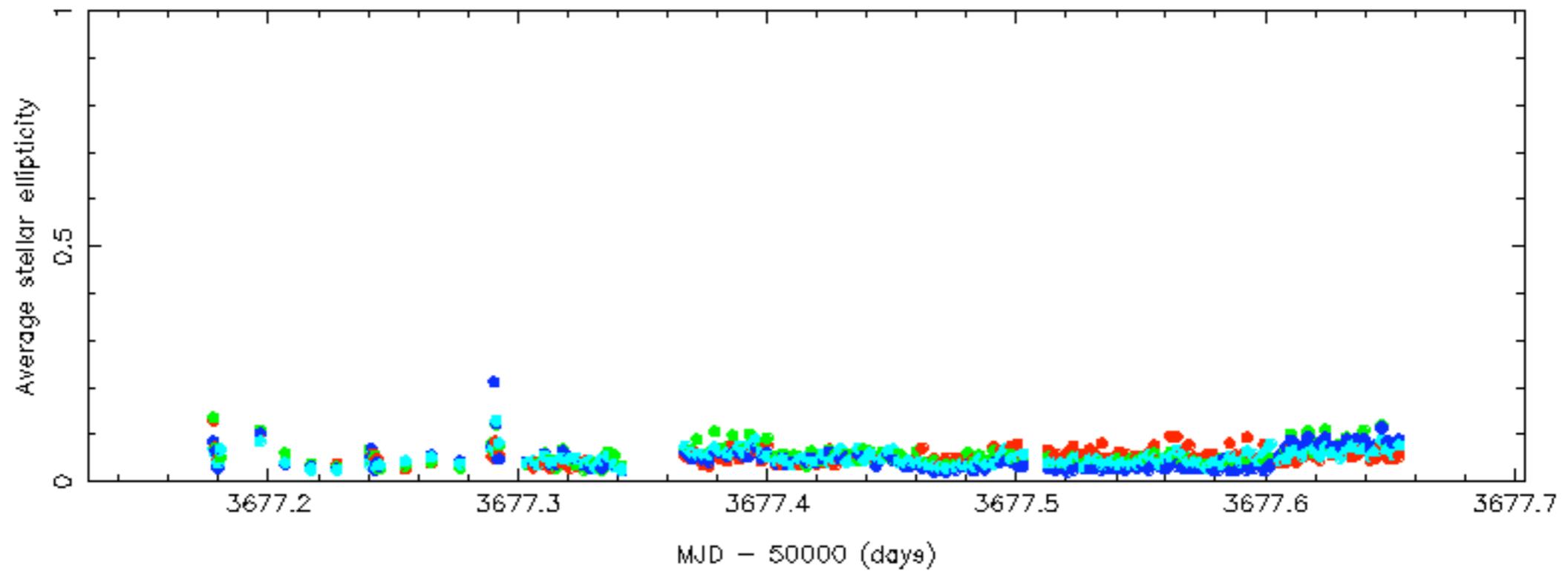
Attenuation (SkyProbe@CFHT)







Chips colour codes: #1 #2 #3 #4



• PostgreSQL Database

- Normalised, Materialised Views

- Ingestion layer validates data

- Only image metadata not the catalogues

- PostgreSQL Database

- Normalised, Materialised Views

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- Feeding/allowing:

- Internal data management

- Data processing status (night basis)

- UKIDSS Survey progress

- Feedback on survey efficiency/statistics

- Sky brightness analysis

WFCAM

Data Reduction Progress

Data Processing — Cambridge Astronomical Survey Unit

http://casu.ast.cam.ac.uk/surveys-projects/wfcam/data-processing/report_night_reduction_status_casu?semester=06A&SUBMIT=Submit+Query

CASU DQC FAP ADS & Co. Observations CASU GAIA Java My Shares (3493) / & Co. (4)

Information on DQC plot... Data Processing — Cam...

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Cambridge Astronomical Survey Unit

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WFCAM Data Reduction Progress::Semester 06A

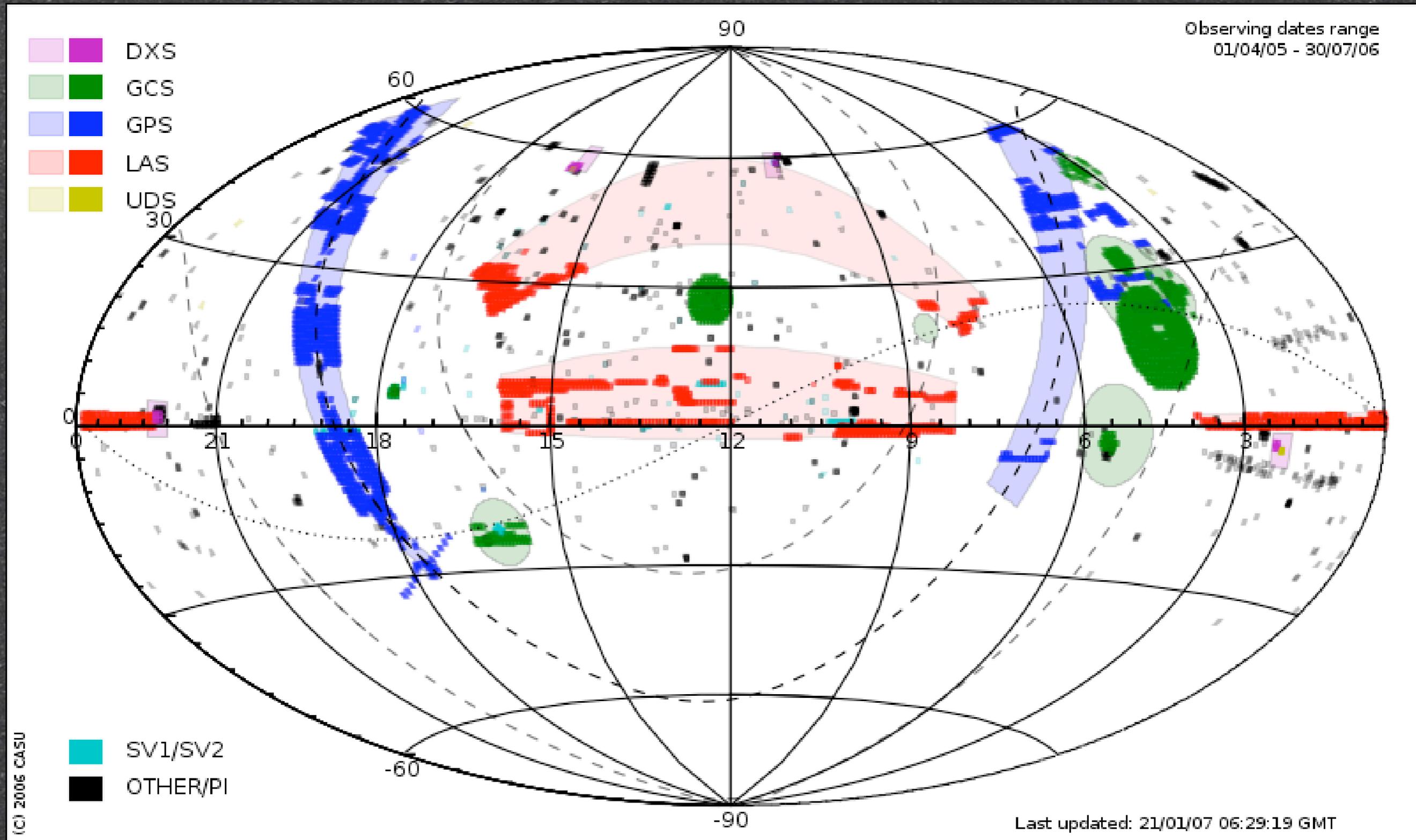
This page displays the reduction progress of WFCAM data. Information is automatically updated every hour (you need to reload the page).

[Back to WFCAM start page.](#)

Night	Status	N _{raw}	N _{ESO}	Checked	Transferred by WFAU	Last header update	Version	Summary Plots	Photometry Plots	Summary Info	Observation Log	Size raw [Gb]	Size red [Gb]	N stacks All	N stacks UKIDSS	N stacks LAS	N stacks DXS	N stacks UDS	N stacks GPS	N stacks GCS
2006/04/28	reduced	476	361	23 Aug 2006	06 Sep 2006	07 Dec 2006	1	GIF1 GIF2	GIF	summary.list	obs_index	8.86	16.13	39	30	0	0	0	30	0
2006/04/29	reduced	411	366	23 Aug 2006	06 Sep 2006	07 Dec 2006	1	GIF1 GIF2	GIF	summary.list	obs_index	8.60	2.58	22	0	0	0	0	0	0
2006/04/30	reduced	145	133	23 Aug 2006	06 Sep 2006	07 Dec 2006	1	GIF1 GIF2	GIF	summary.list	obs_index	2.01	1.68	10	0	0	0	0	0	0
2006/05/01	reduced	1055	794	23 Aug 2006	06 Sep 2006	07 Dec 2006	1	GIF1 GIF2	GIF	summary.list	obs_index	20.46	35.09	126	69	42	0	0	27	0
2006/05/02	reduced	1290	139	23 Aug 2006	06 Sep 2006	07 Dec 2006	1	GIF1 GIF2	GIF	summary.list	obs_index	24.99	50.84	47	0	0	0	0	0	0
2006/05/03	reduced	2402	640	23 Aug 2006	06 Sep 2006	07 Dec 2006	1	GIF1 GIF2	GIF	summary.list	obs_index	32.26	47.46	44	0	0	0	0	0	0
2006/05/04	reduced	1564	182	23 Aug 2006	06 Sep 2006	07 Dec 2006	1	GIF1 GIF2	GIF	summary.list	obs_index	29.42	60.45	60	0	0	0	0	0	0
2006/05/05	reduced	1639	116	23 Aug 2006	06 Sep 2006	07 Dec 2006	1	GIF1 GIF2	GIF	summary.list	obs_index	25.64	44.36	37	0	0	0	0	0	0
2006/05/06	nodata	66	55								obs_index	0.69								
2006/05/07	nodata	0																		
2006/05/08	nodata	554									obs_index	5.57								
2006/05/09	nodata	768	84								obs_index	7.09								
2006/05/10	reduced	2516	1918	25 Aug 2006	27 Sep 2006	07 Dec 2006	1	GIF1 GIF2	GIF	summary.list	obs_index	42.30	76.66	257	226	0	0	0	0	226
2006/05/11	reduced	2603	2553	25 Aug 2006	23 Sep 2006	07 Dec 2006	1	GIF1 GIF2	GIF	summary.list	obs_index	49.60	128.29	357	330	2	0	0	107	221
2006/05/12	reduced	1841	1823	25 Aug 2006	27 Sep 2006	07 Dec 2006	1	GIF1 GIF2	GIF	summary.list	obs_index	25.06	57.71	220	178	80	0	0	57	27

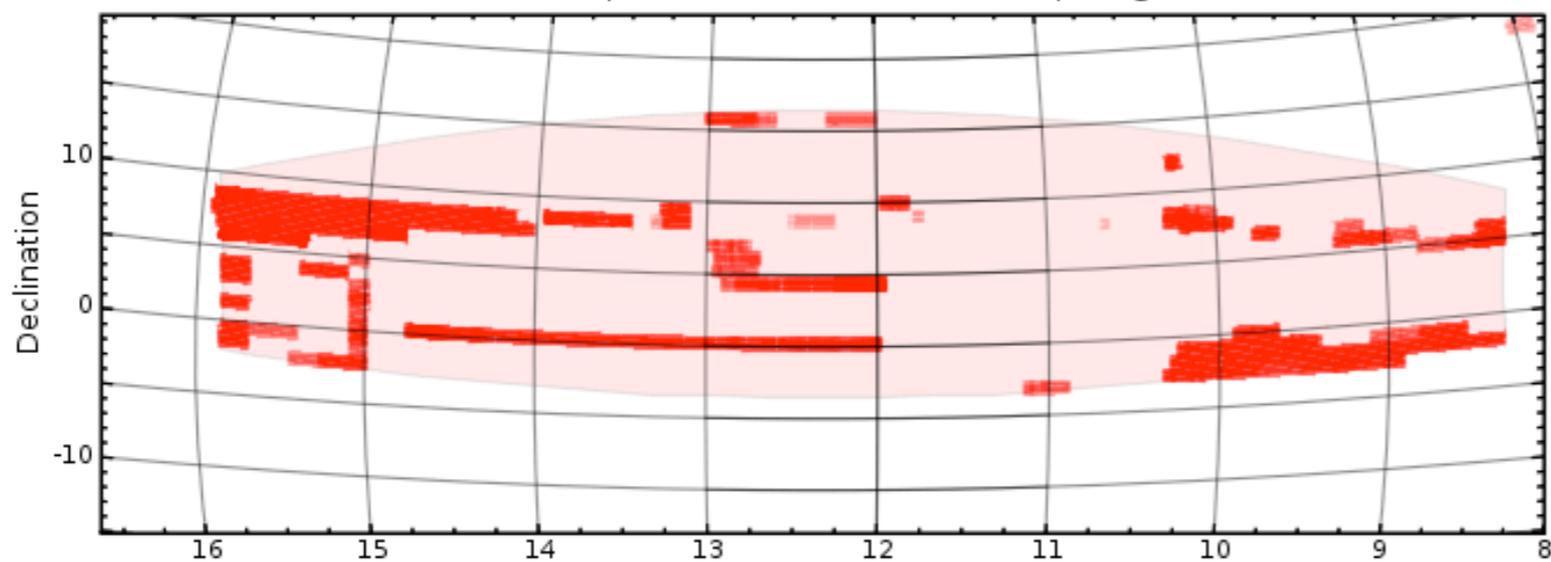
http://casu.ast.cam.ac.uk/surveys-projects/wfcam

UKIDSS Survey Progress

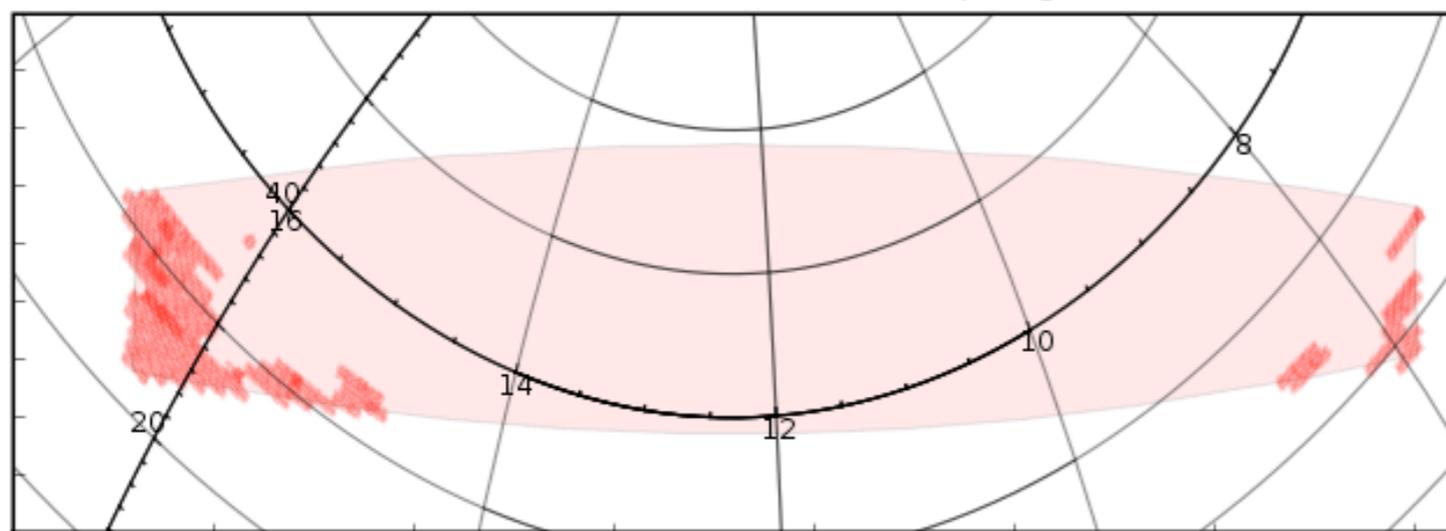


Credit: E. Gonzalez-Solares

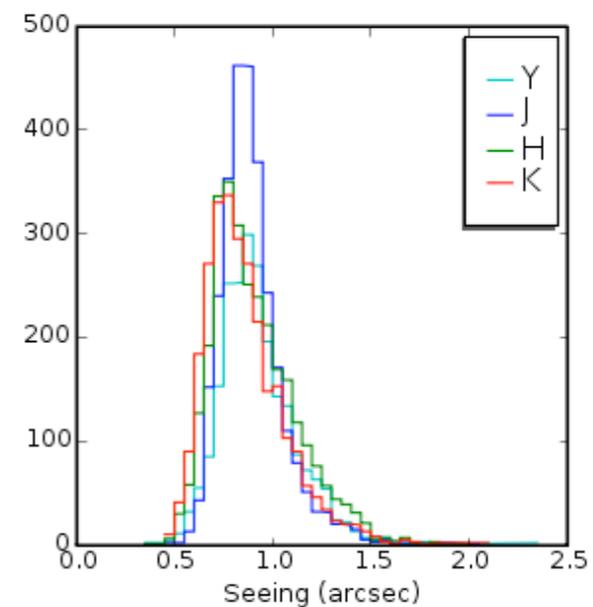
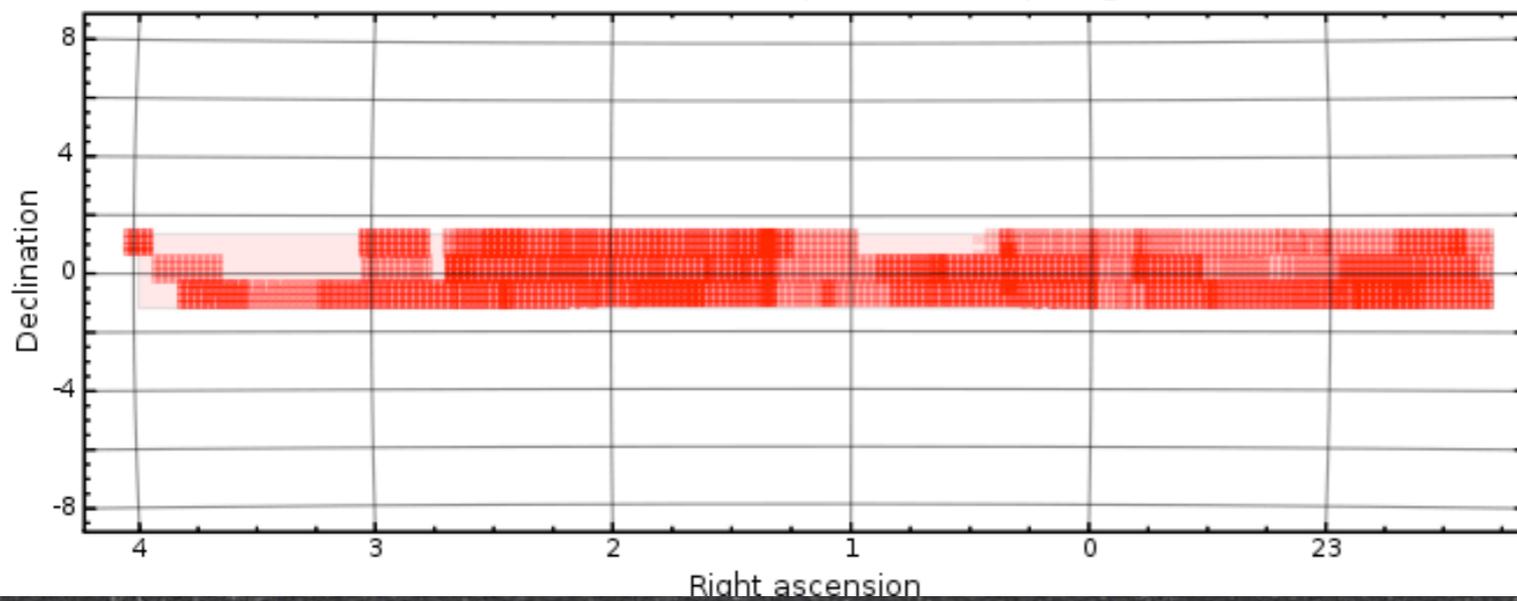
LAS Equatorial Block: 1907.6 sq. deg.



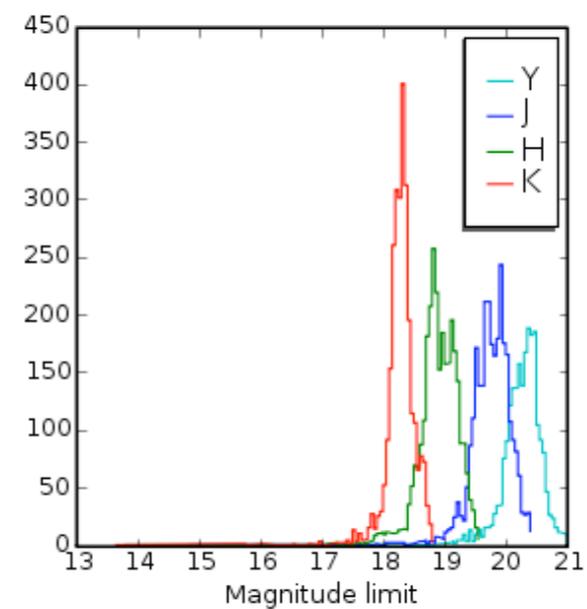
LAS Northern Block: 1907.6 sq. deg.



LAS Southern Stripe: 212.5 sq. deg.



	<90%	<80%	<50%	<20%	<10%
Y	1.14	1.02	0.85	0.72	0.66
J	1.04	0.94	0.82	0.72	0.67
H	1.15	1.03	0.81	0.68	0.62
K	1.08	0.96	0.77	0.64	0.59

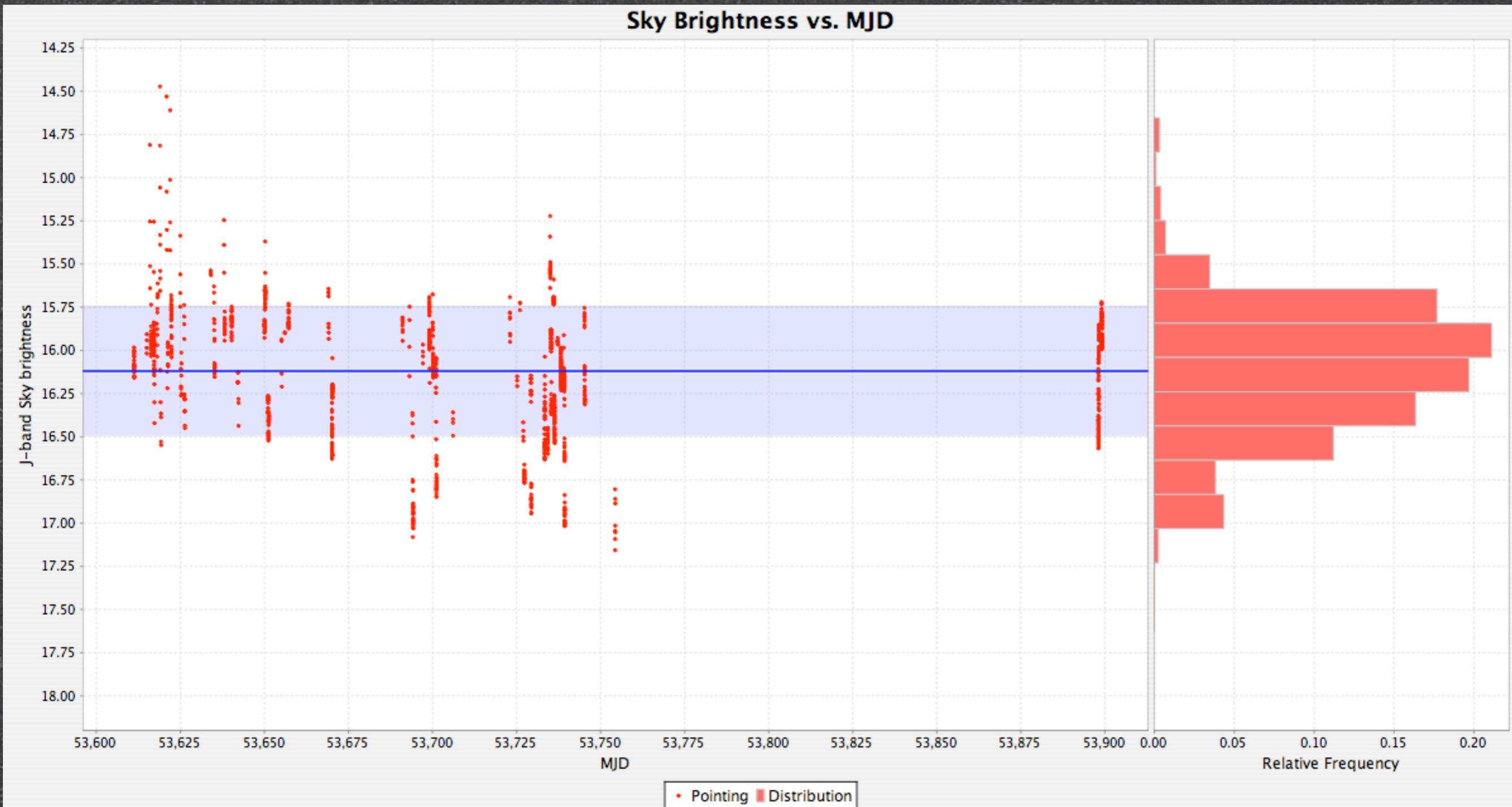


	<90%	<80%	<50%	<20%	<10%
Y	20.55	20.44	20.26	20.02	19.87
J	20.07	19.96	19.73	19.48	19.36
H	19.22	19.12	18.86	18.65	18.48
K	18.50	18.39	18.25	18.11	18.01

Sky Brightness at Mauna Kea

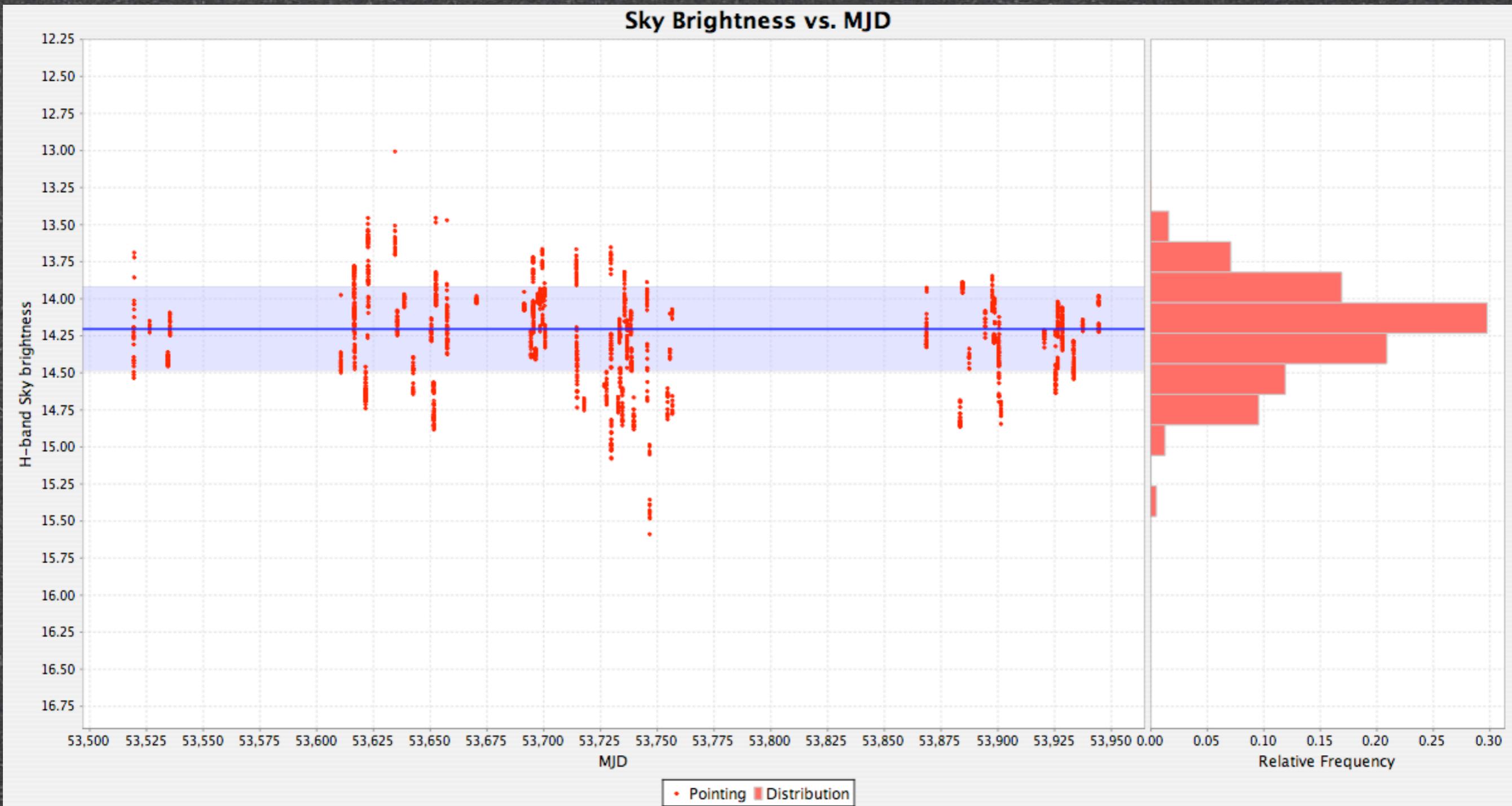
(work in progress)

Dark-time: J-band



$sky_J = 16.11$ mag $\sigma_J = 0.38$ mag $N = 1343$

Dark-time: H band

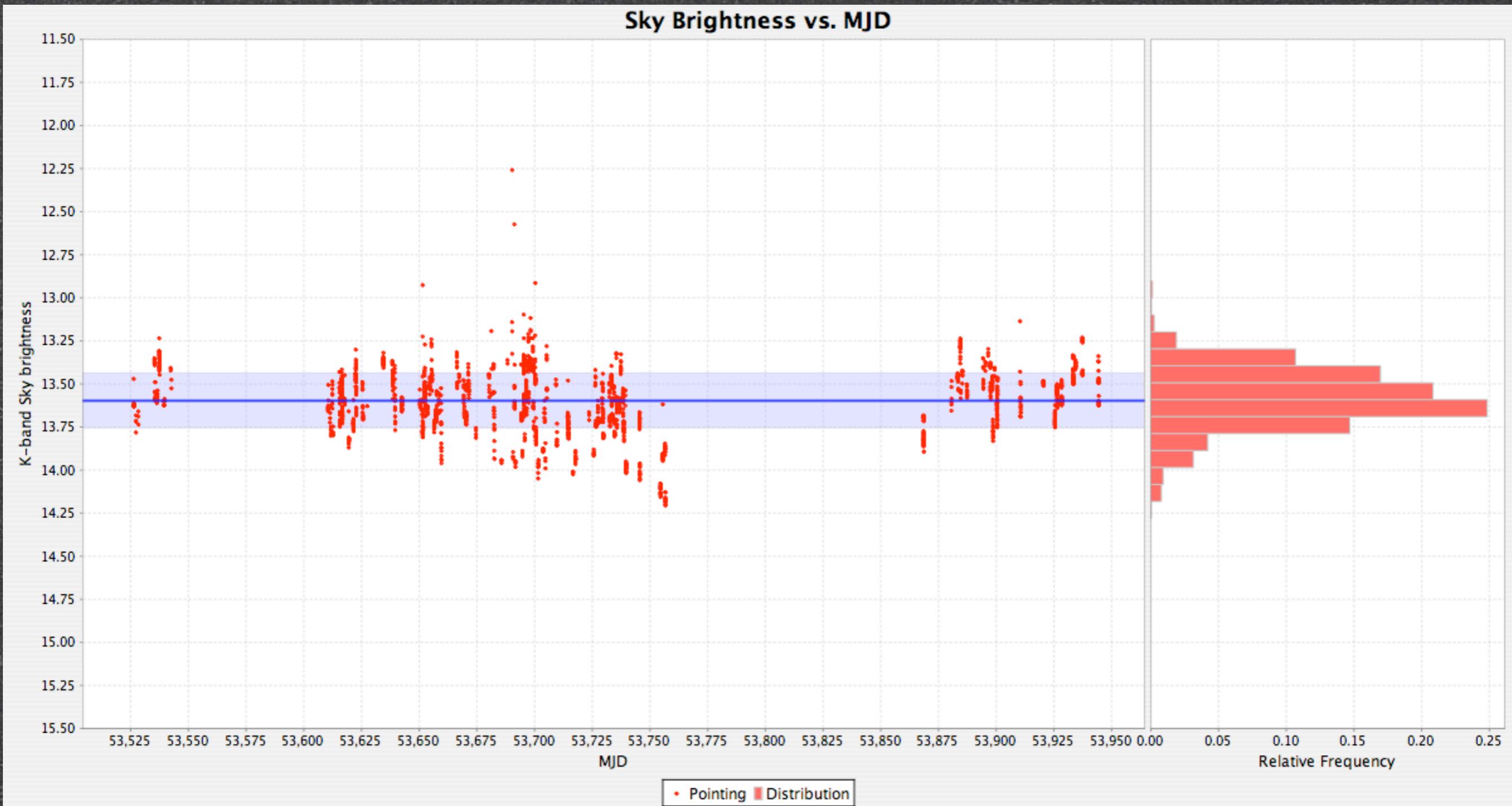


$sky_H = 14.20$ mag

$\sigma_H = 0.29$ mag

$N = 1824$

Dark-time: K band

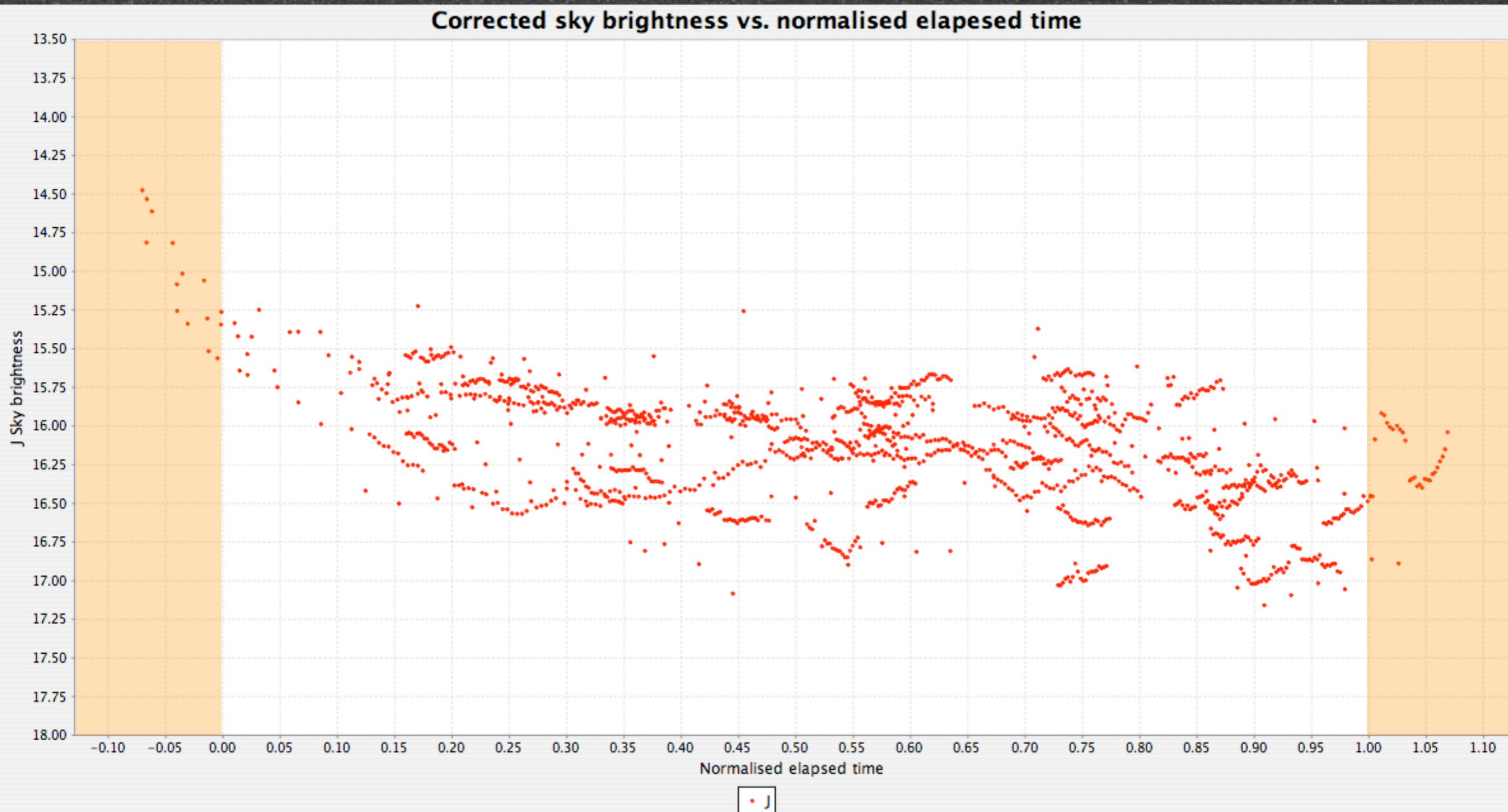


$sky_K = 13.59$ mag

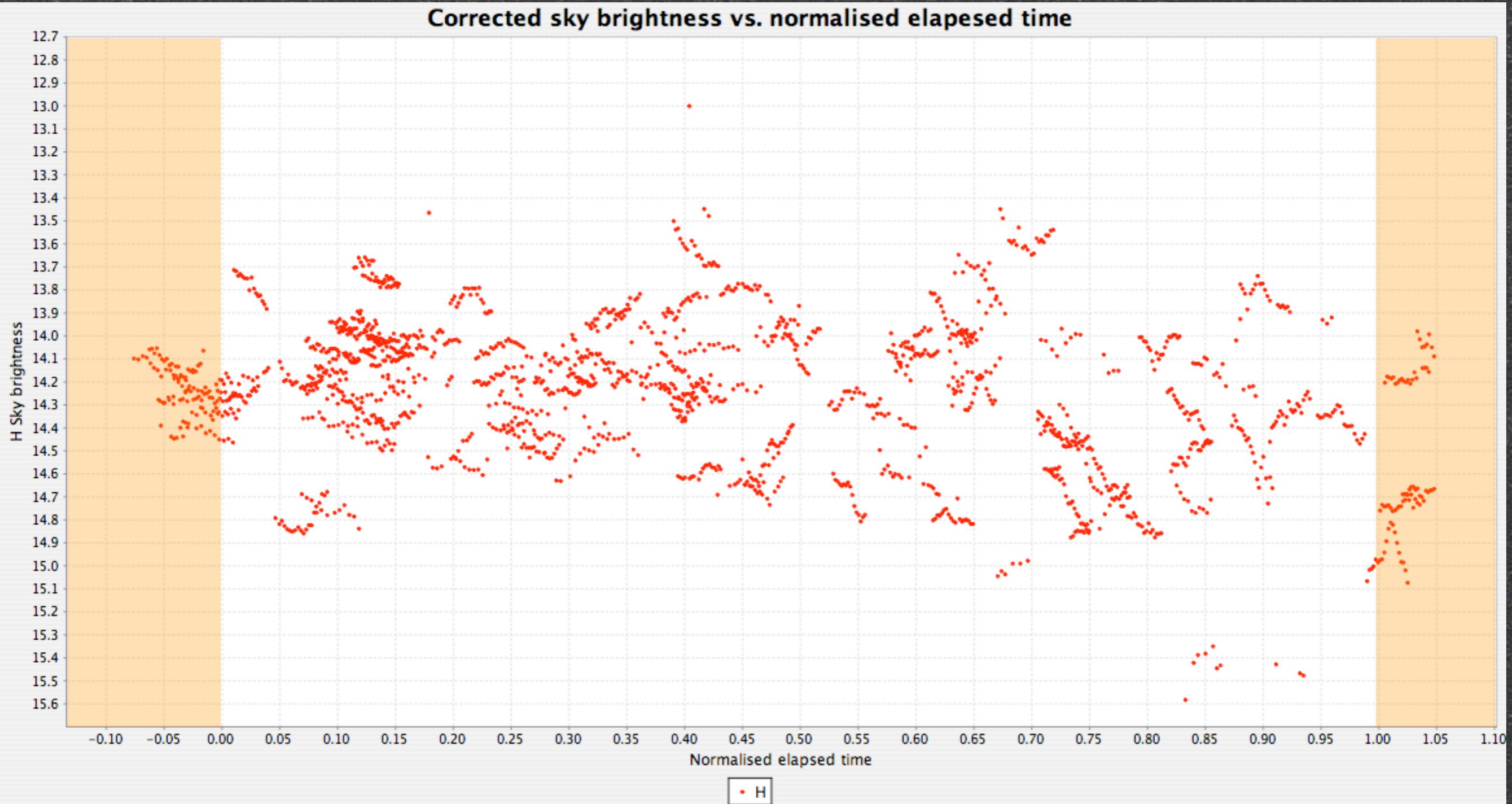
$\sigma_K = 0.16$ mag

$N = 2423$

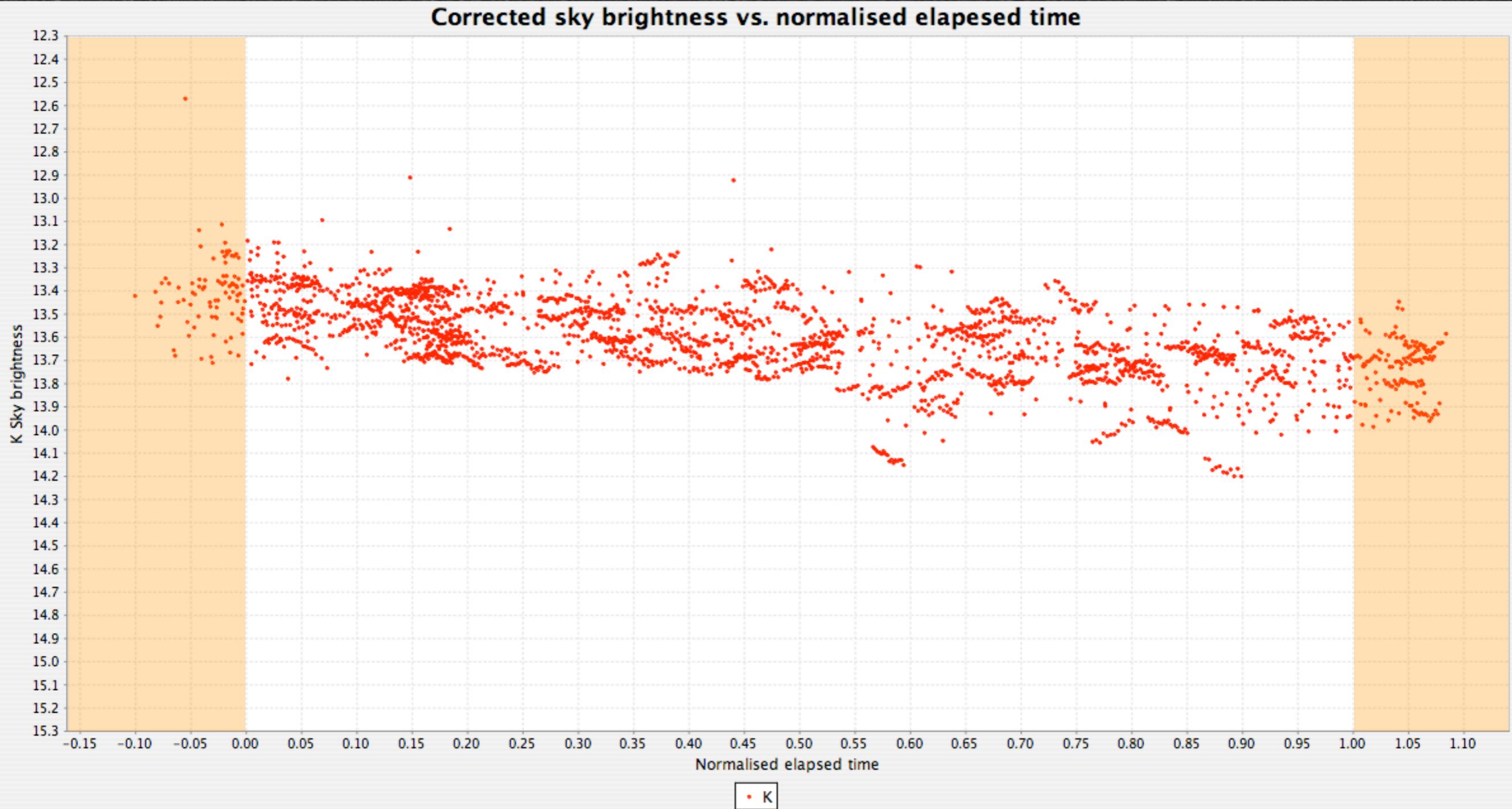
Trends I - time J



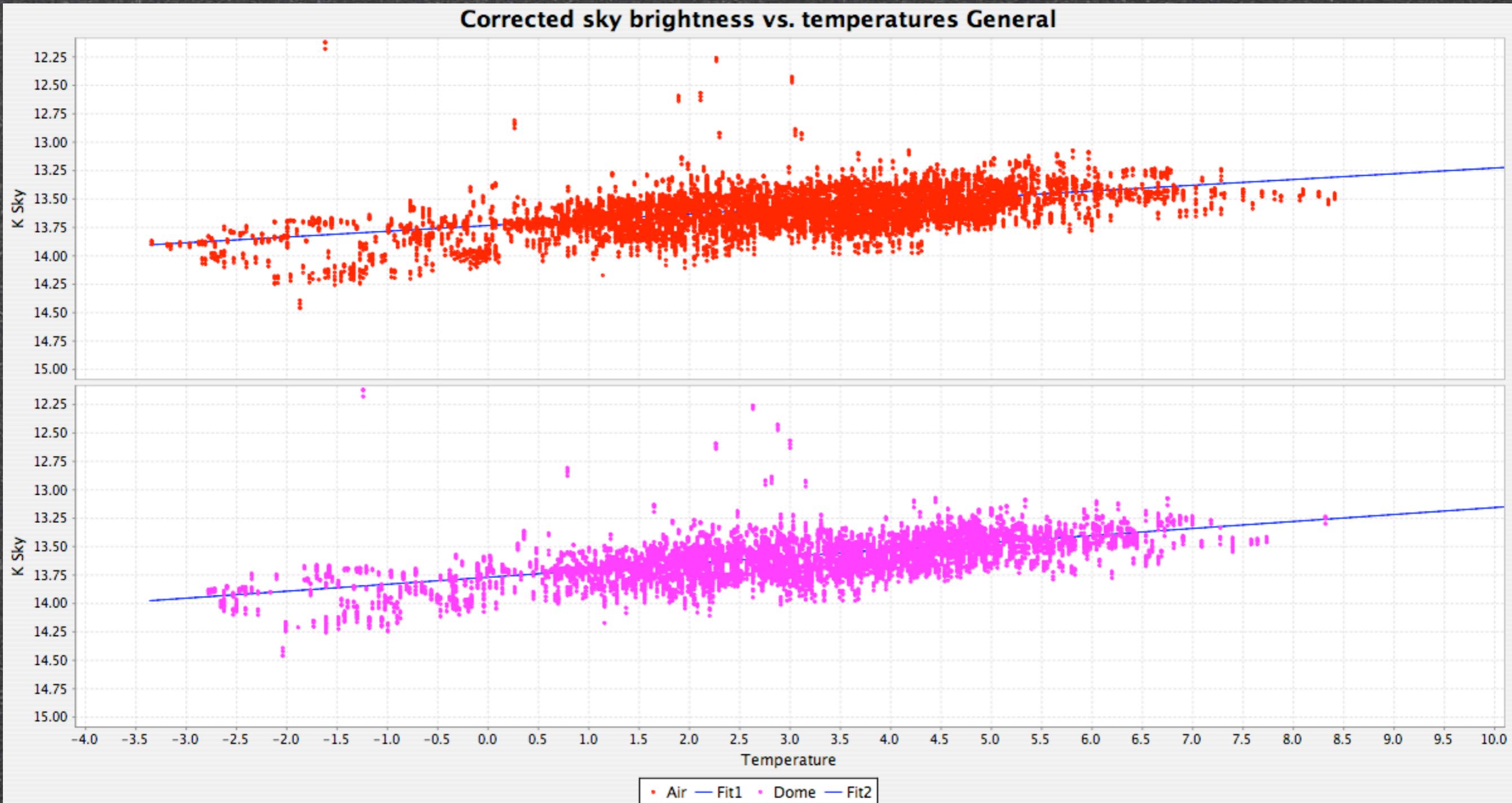
Trends I - time H



Trends I - time K



Trends II - Temp. K



Sky brightness trends

Conclusions

- Sky gets darker toward the end of the night
- HK see “dark” twilights
- K sky gets brighter with increasing T at a rate of ~ 0.03 mag/deg
- Moon does not make an appreciable difference

Thanks for your attention

Any questions ?

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CASU: <http://casu.ast.cam.ac.uk>

<http://www.ukidss.org>

<http://www.vista.ac.uk>