

# Quality control monitoring for WFCAM



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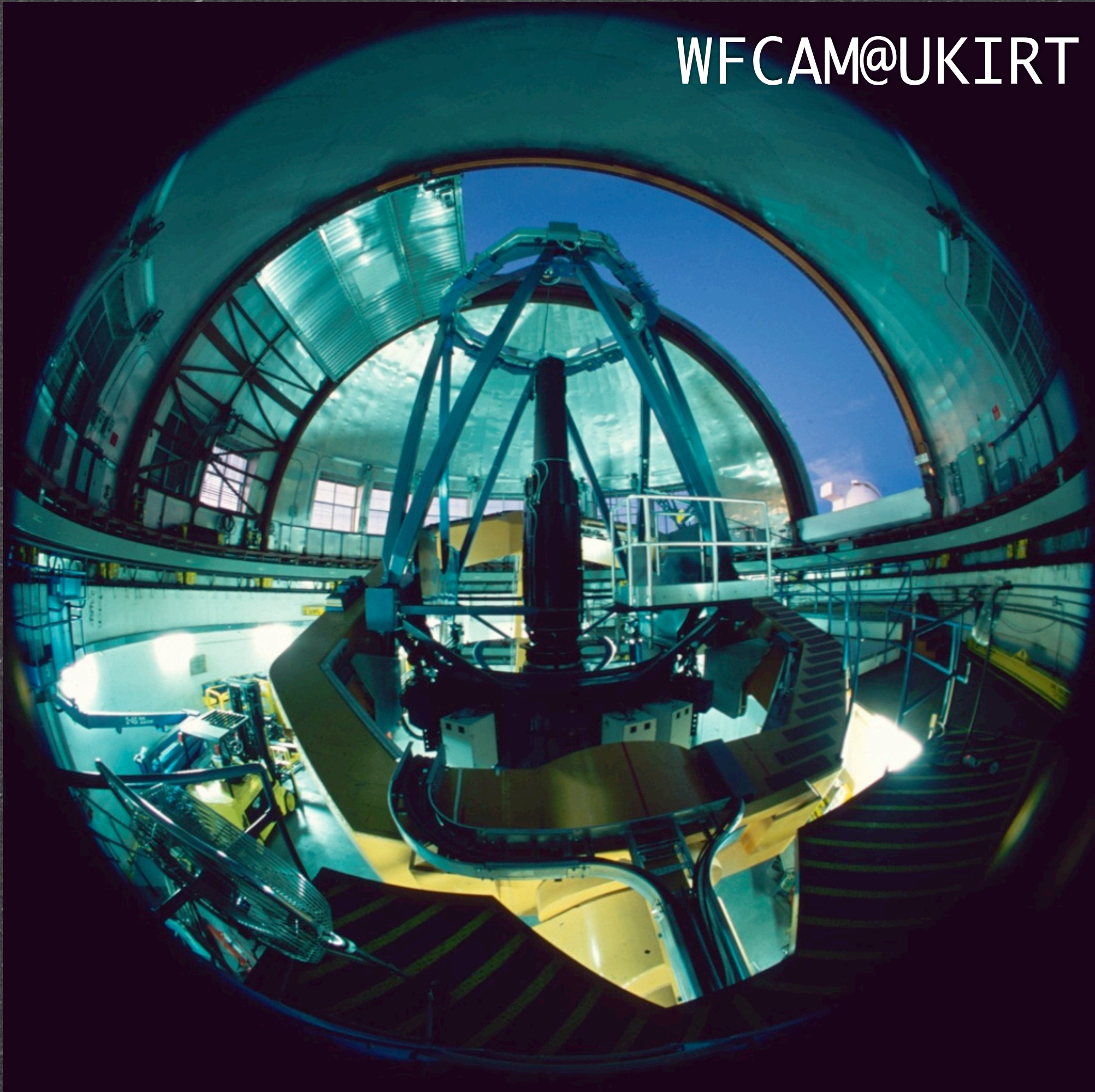


# Talk outline

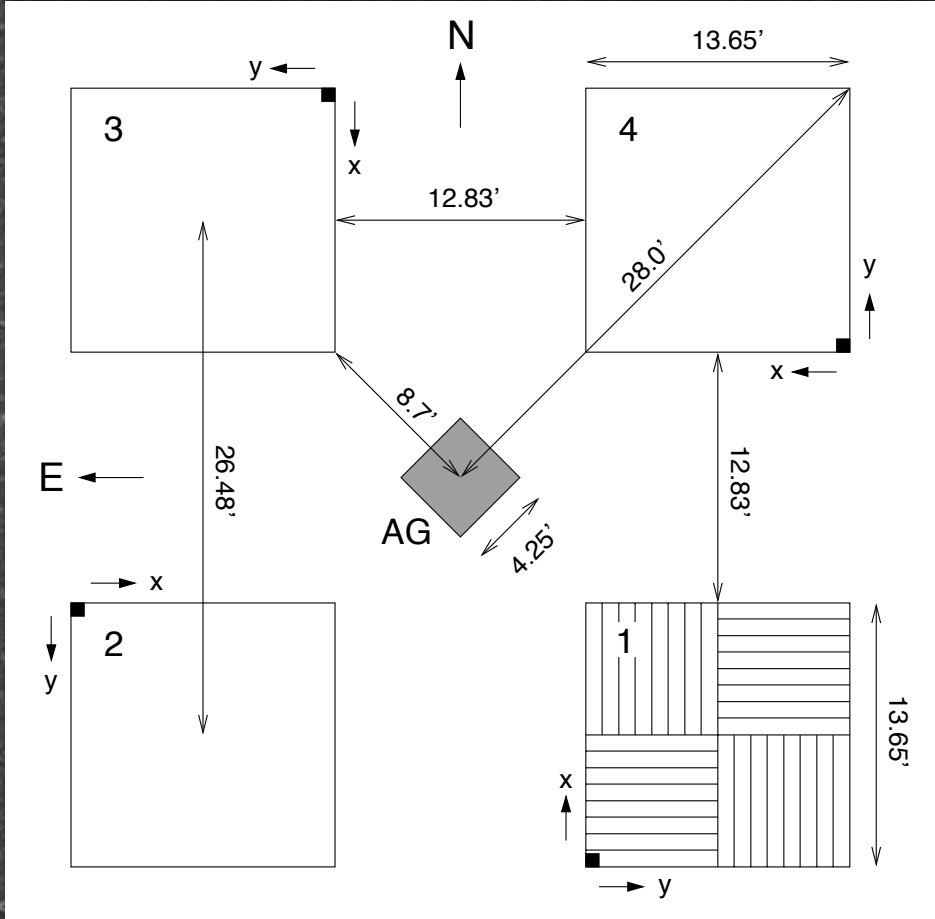
- WFCAM overview
- WFCAM operations at CASU
- Quality control
- Mauna Kea NIR sky



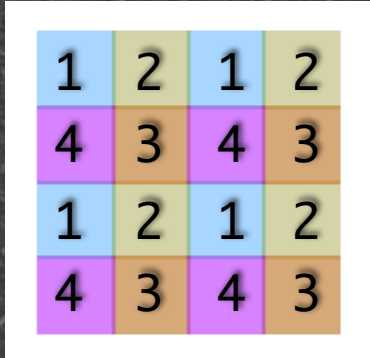
WFCAM@UKIRT



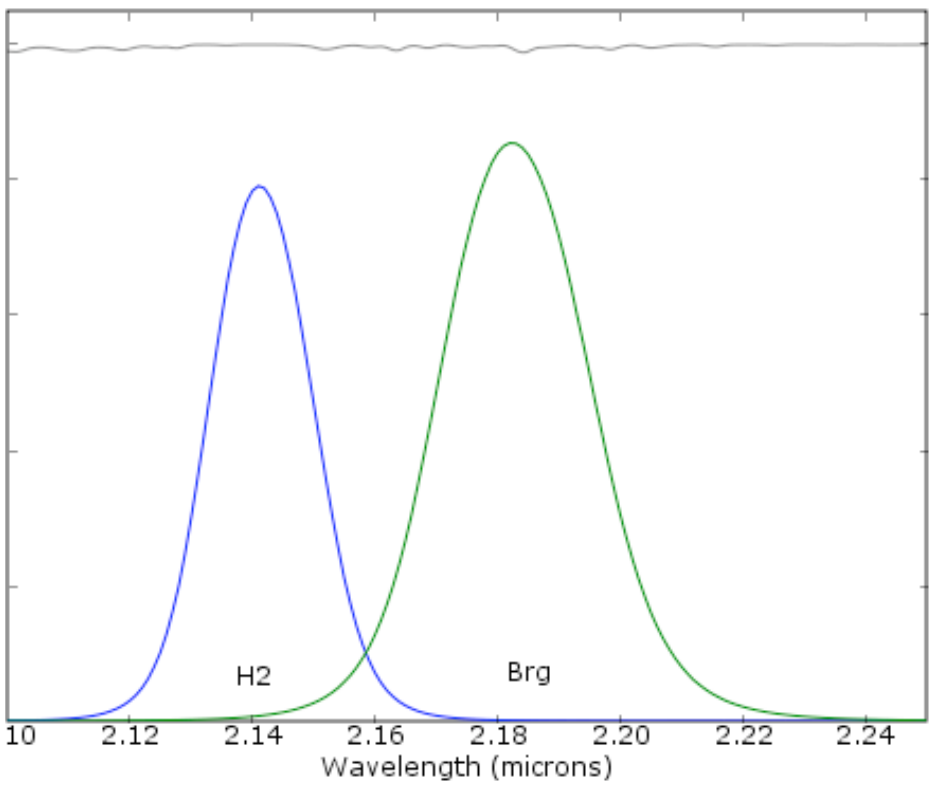
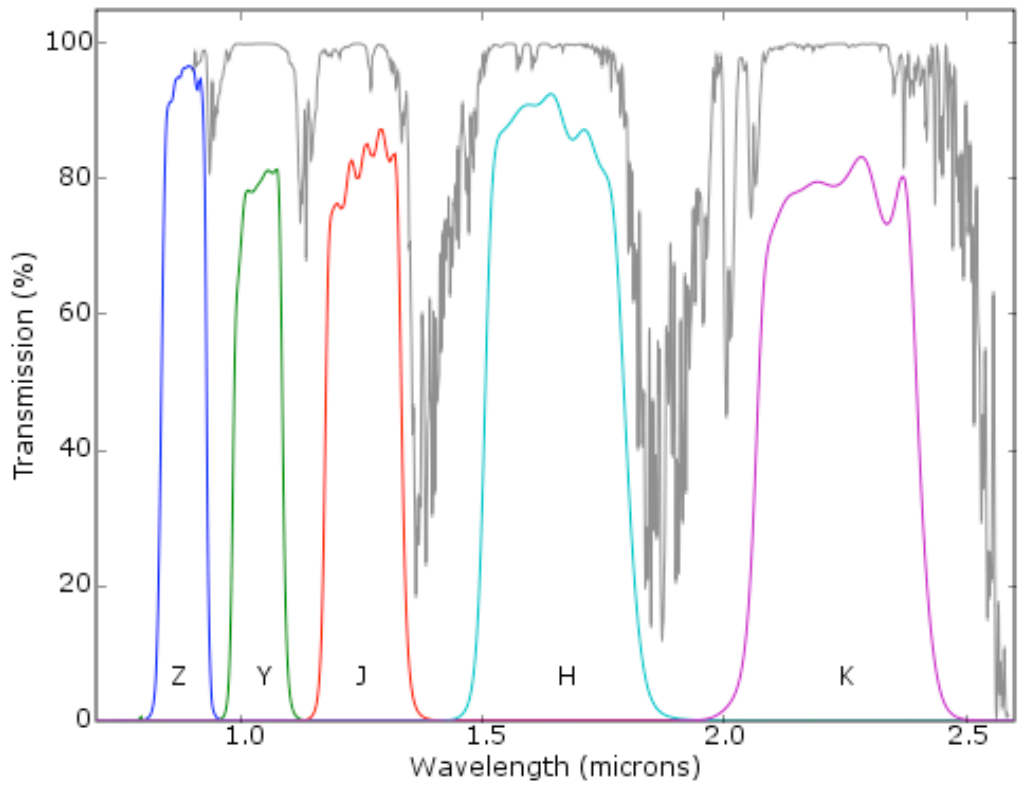




Detectors	4 Rockwell-Hawaii-II (HgCdTe 2K x 2k)
Scale	0.4 arcsec/pix
F.O.V.	0.8 sq.deg.
Filter set	Z Y J H K - H <sub>2</sub> Br $\gamma$
Data Volume	~140 Gb/night

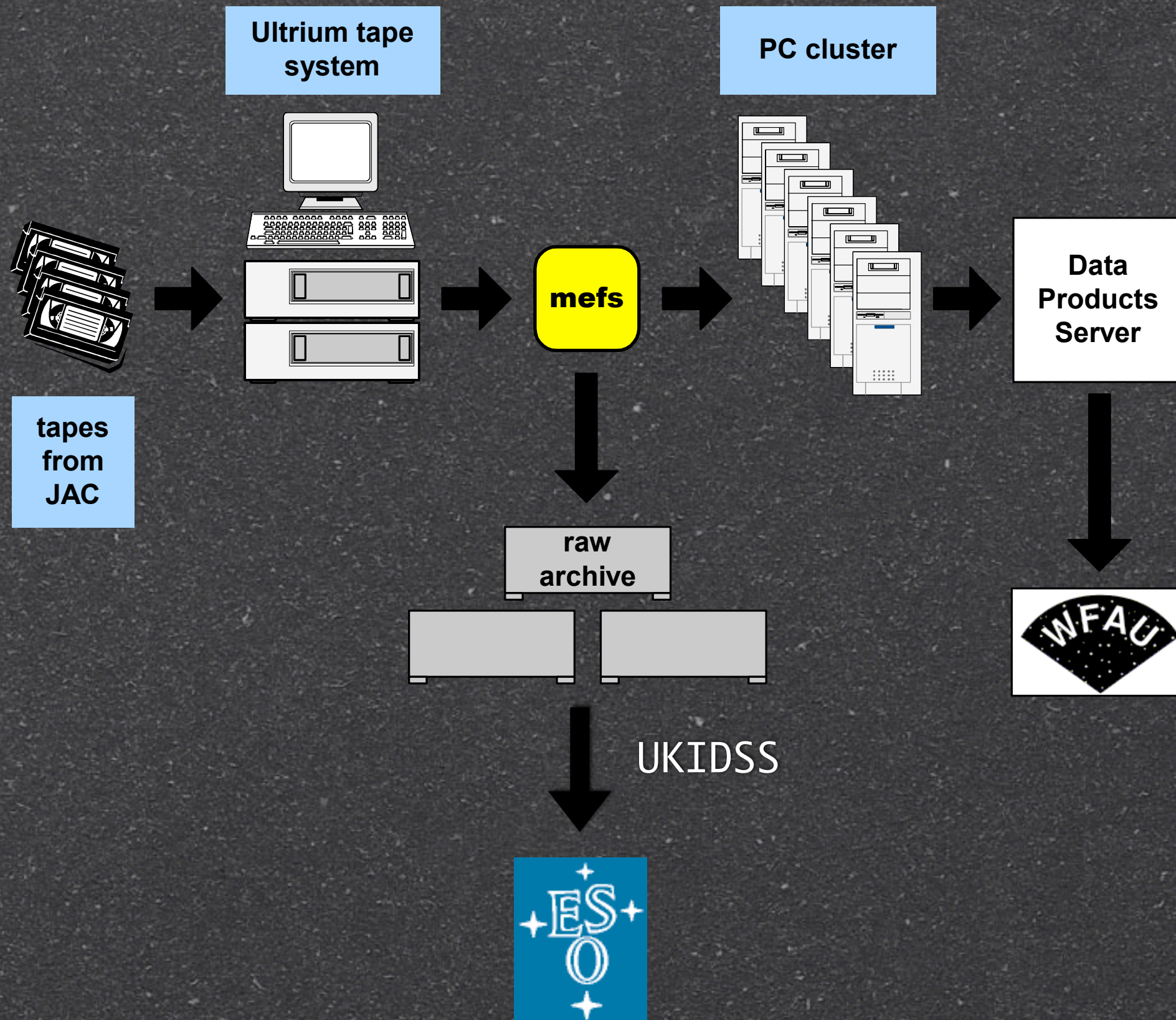


Tile





# 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



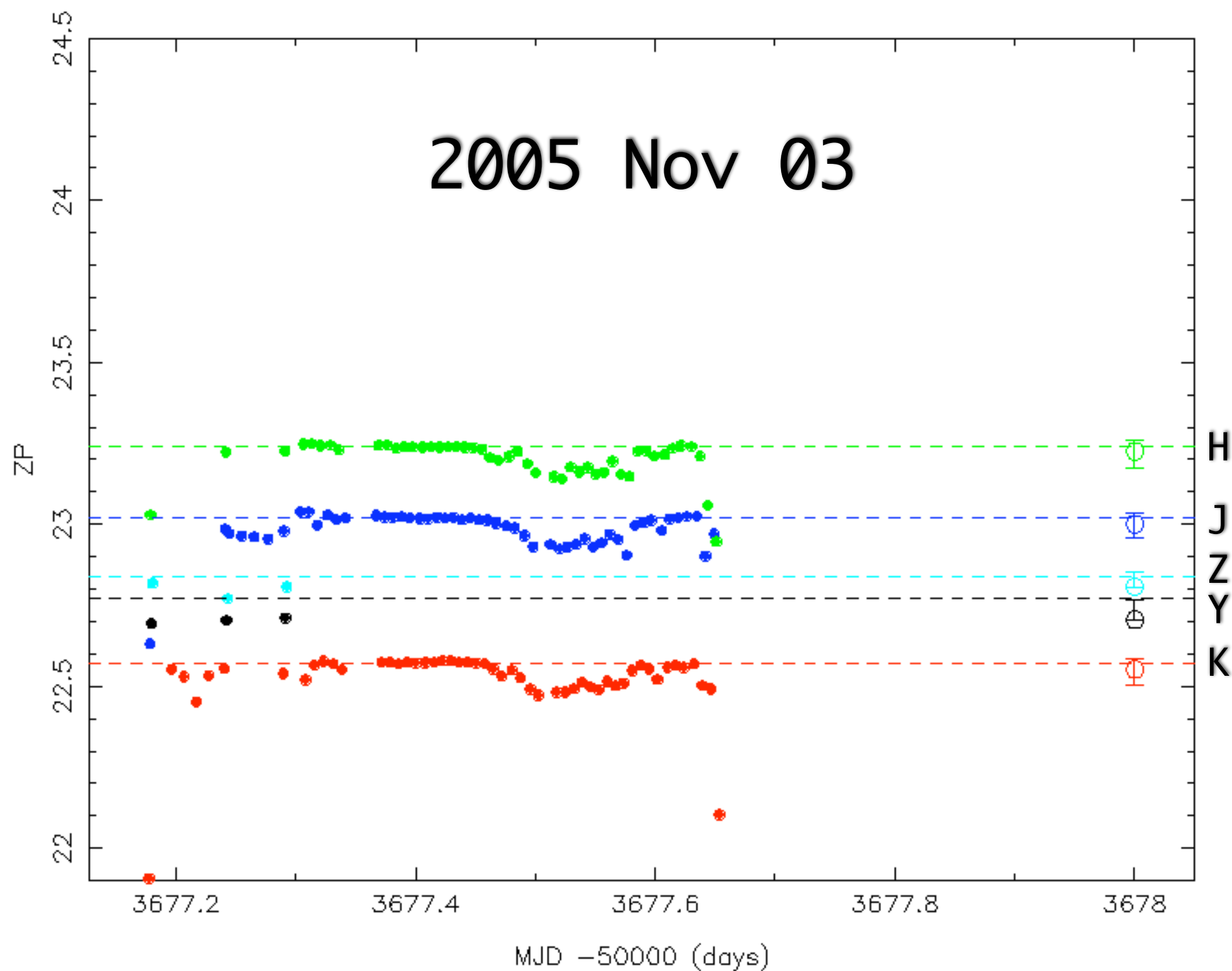
# Operations Summary

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  - Effort required: ~1 FTE
- Processed data:
  - Images (stacked/interleaved) + confidence maps
  - Source catalogues (FITS binary tables, 80 cols.)
  - QC measures (FITS headers) + summary plots/ascii



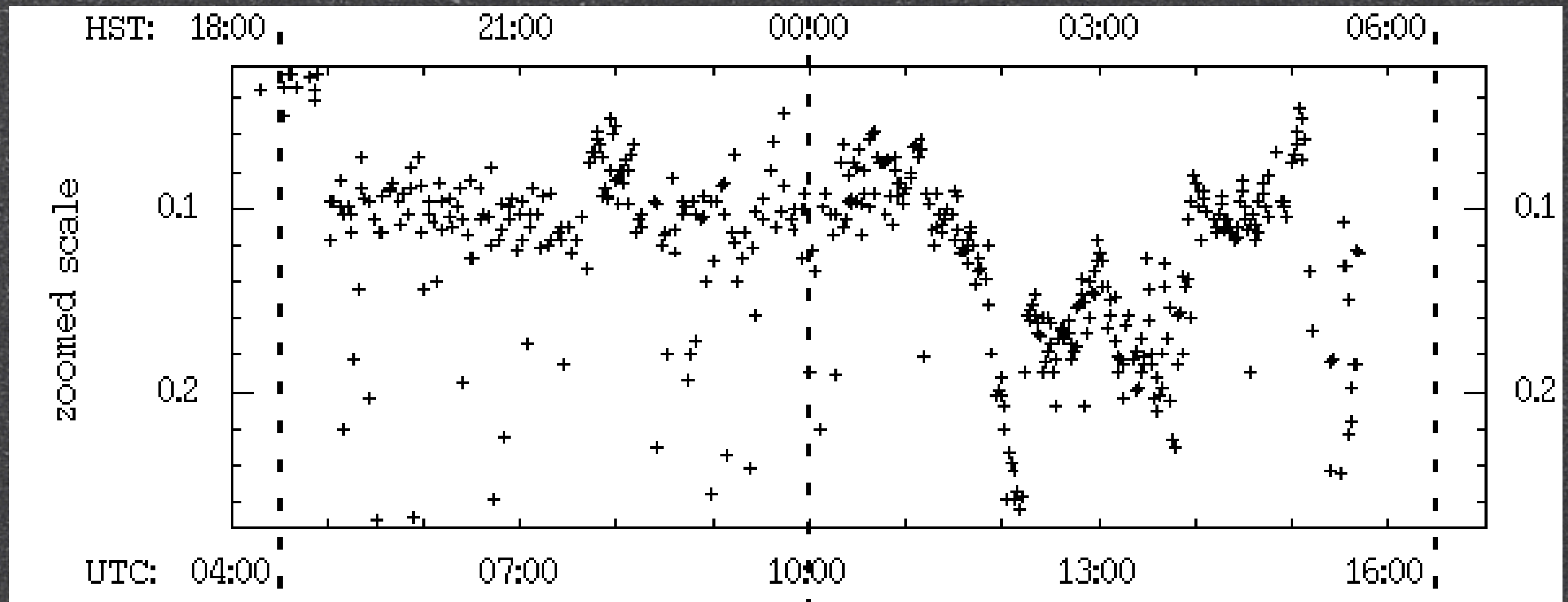
Photometric zero-points

2005 Nov 03

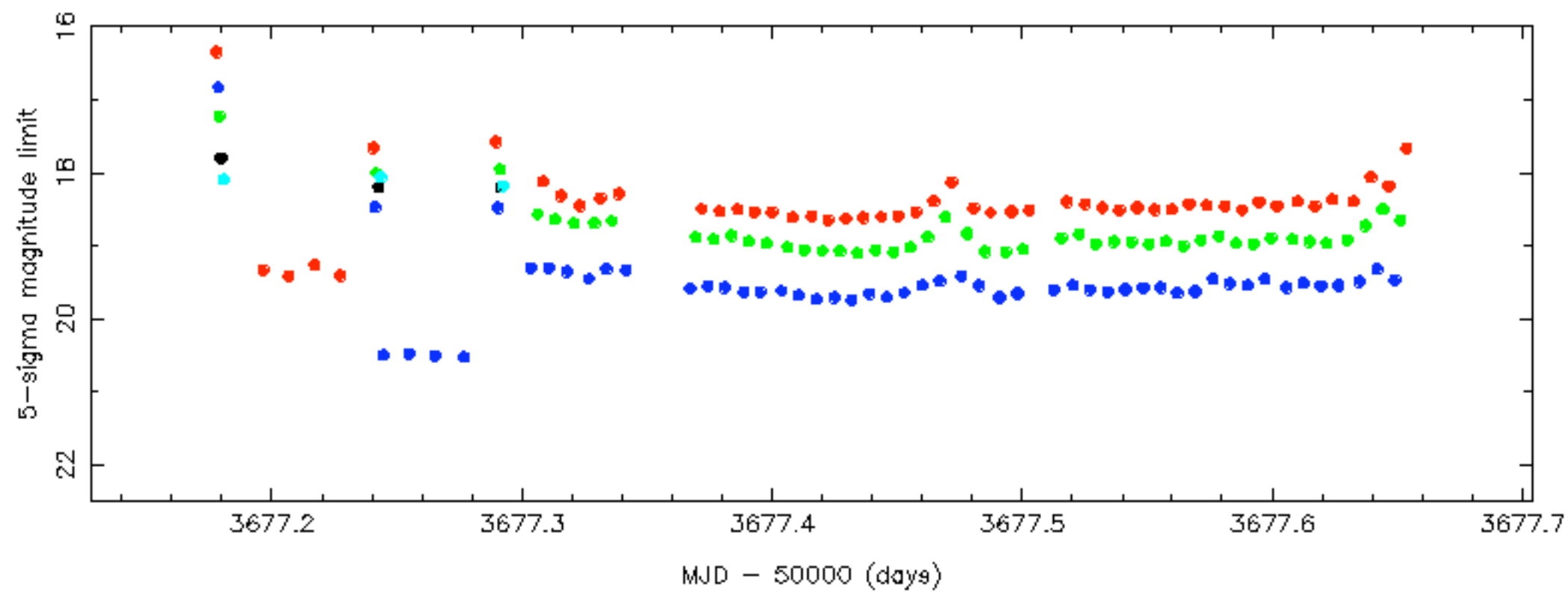
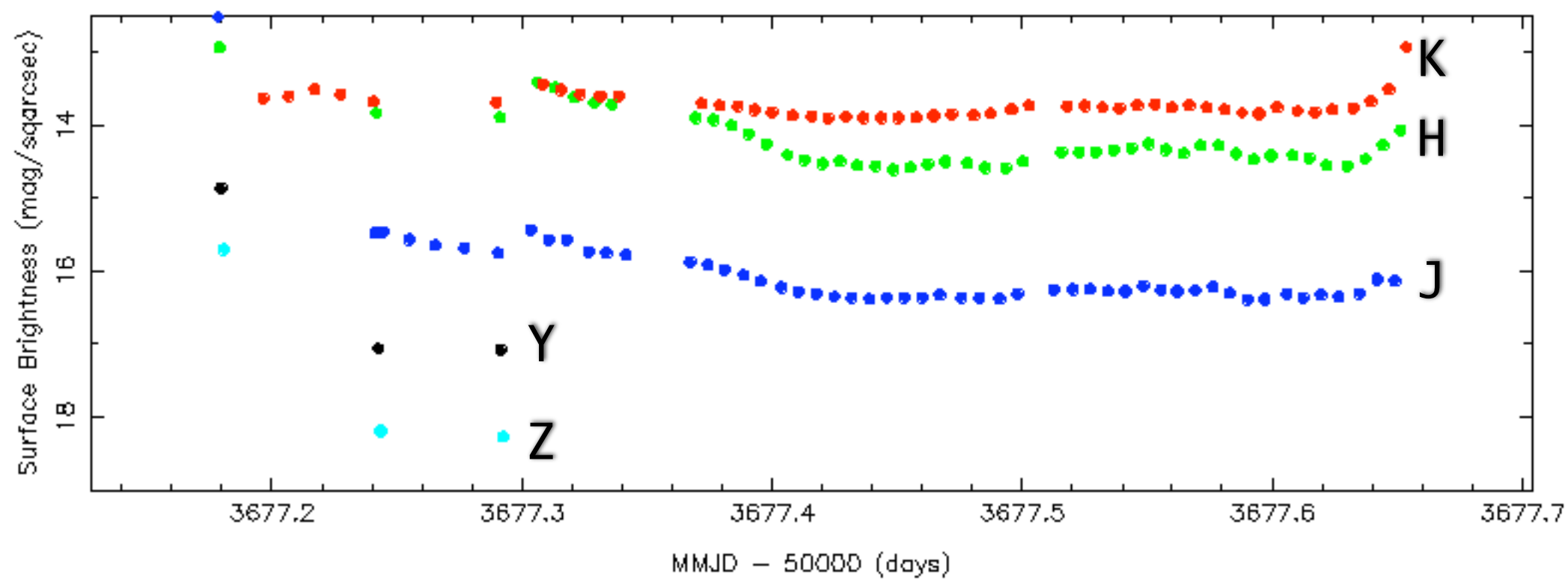




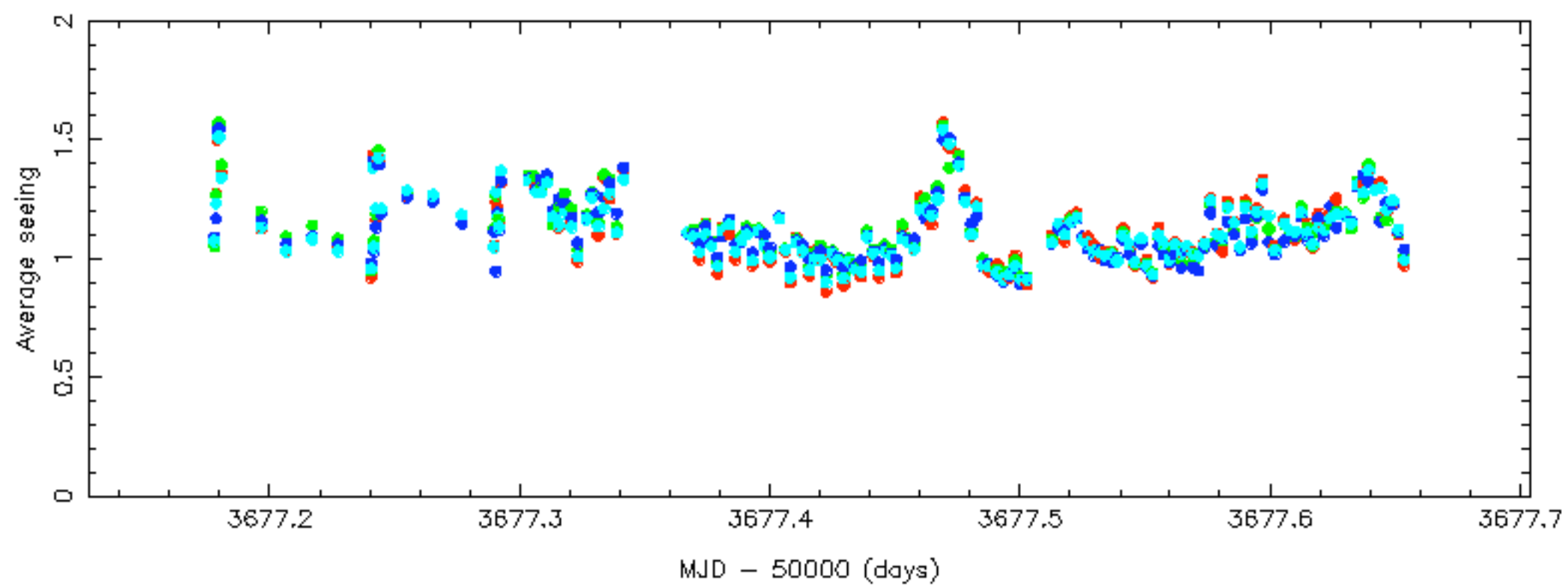
# Attenuation (SkyProbe@CFHT)



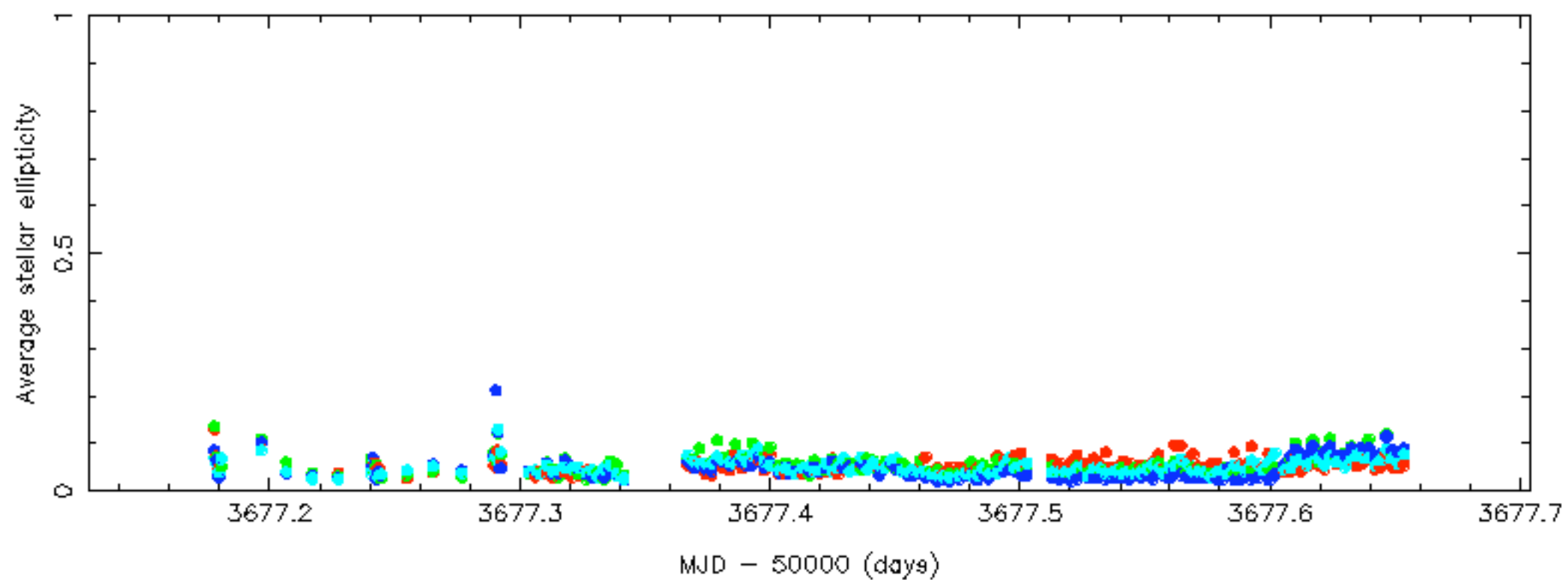








Chips colour codes: #1 #2 #3 #4









- PostgreSQL Database

- Normalised, Materialised Views

- Ingestion layer validates data

- Only image metadata not the catalogues



- PostgreSQL Database

- Normalised, Materialised Views

- Ingestion layer validates data

- Only image metadata not the catalogues

- 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).

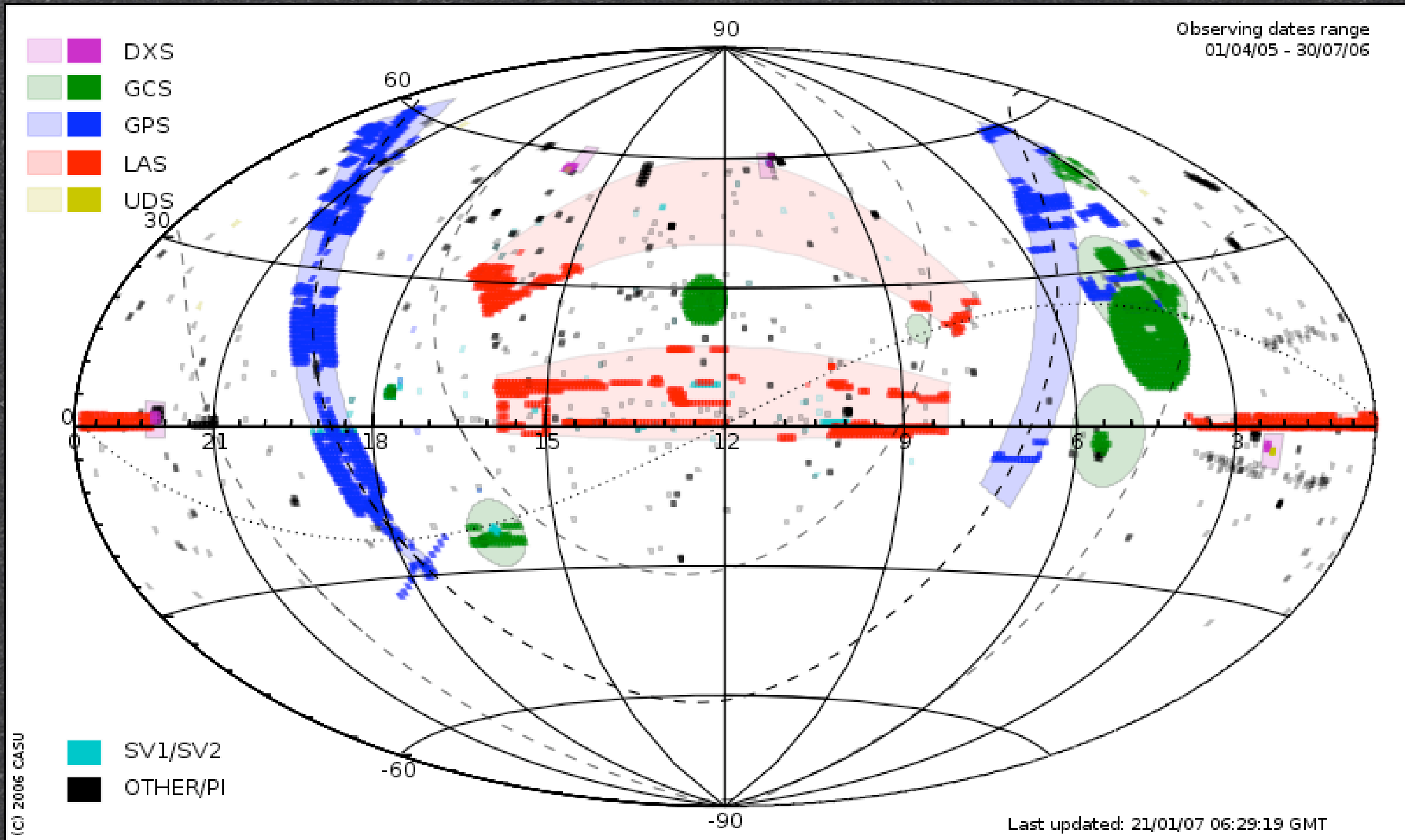
[Back to WFCAM start page.](#)

Night	Status	N <sub>raw</sub>	N <sub>ESO</sub>	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	<a href="#">GIF1</a> <a href="#">GIF2</a>	<a href="#">GIF</a>	<a href="#">summary.list</a>	<a href="#">obs_index</a>	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	<a href="#">GIF1</a> <a href="#">GIF2</a>	<a href="#">GIF</a>	<a href="#">summary.list</a>	<a href="#">obs_index</a>	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	<a href="#">GIF1</a> <a href="#">GIF2</a>	<a href="#">GIF</a>	<a href="#">summary.list</a>	<a href="#">obs_index</a>	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	<a href="#">GIF1</a> <a href="#">GIF2</a>	<a href="#">GIF</a>	<a href="#">summary.list</a>	<a href="#">obs_index</a>	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	<a href="#">GIF1</a> <a href="#">GIF2</a>	<a href="#">GIF</a>	<a href="#">summary.list</a>	<a href="#">obs_index</a>	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	<a href="#">GIF1</a> <a href="#">GIF2</a>	<a href="#">GIF</a>	<a href="#">summary.list</a>	<a href="#">obs_index</a>	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	<a href="#">GIF1</a> <a href="#">GIF2</a>	<a href="#">GIF</a>	<a href="#">summary.list</a>	<a href="#">obs_index</a>	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	<a href="#">GIF1</a> <a href="#">GIF2</a>	<a href="#">GIF</a>	<a href="#">summary.list</a>	<a href="#">obs_index</a>	25.64	44.36	37	0	0	0	0	0	0
2006/05/06	nodata	66	55								<a href="#">obs_index</a>	0.69								
2006/05/07	nodata	0																		
2006/05/08	nodata	554									<a href="#">obs_index</a>	5.57								
2006/05/09	nodata	768	84								<a href="#">obs_index</a>	7.09								
2006/05/10	reduced	2516	1918	25 Aug 2006	27 Sep 2006	07 Dec 2006	1	<a href="#">GIF1</a> <a href="#">GIF2</a>	<a href="#">GIF</a>	<a href="#">summary.list</a>	<a href="#">obs_index</a>	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	<a href="#">GIF1</a> <a href="#">GIF2</a>	<a href="#">GIF</a>	<a href="#">summary.list</a>	<a href="#">obs_index</a>	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	<a href="#">GIF1</a> <a href="#">GIF2</a>	<a href="#">GIF</a>	<a href="#">summary.list</a>	<a href="#">obs_index</a>	25.06	57.71	220	178	80	0	0	52	27

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



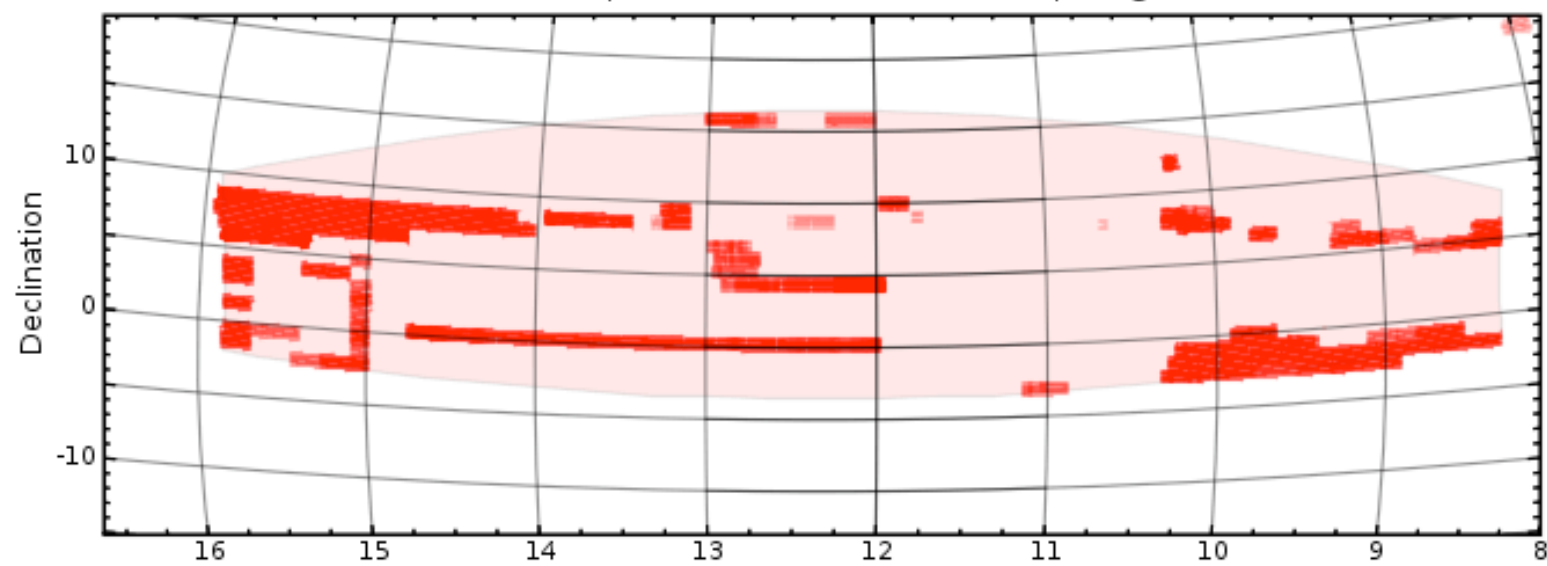
# UKIDSS Survey Progress



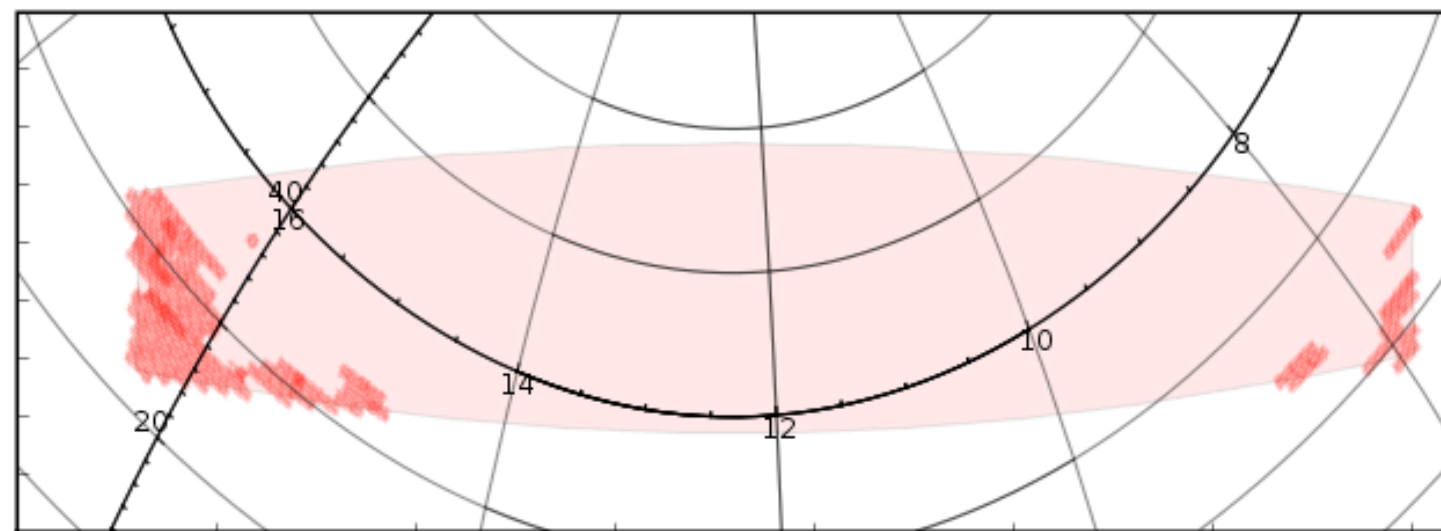
Credit: E. Gonzalez-Solares



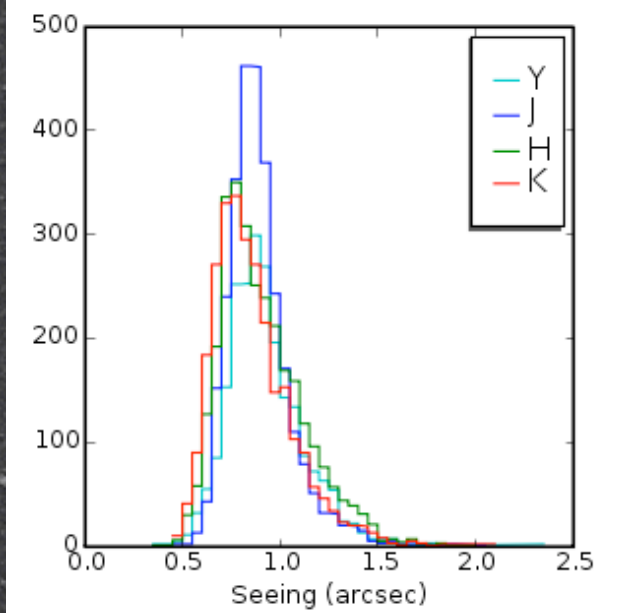
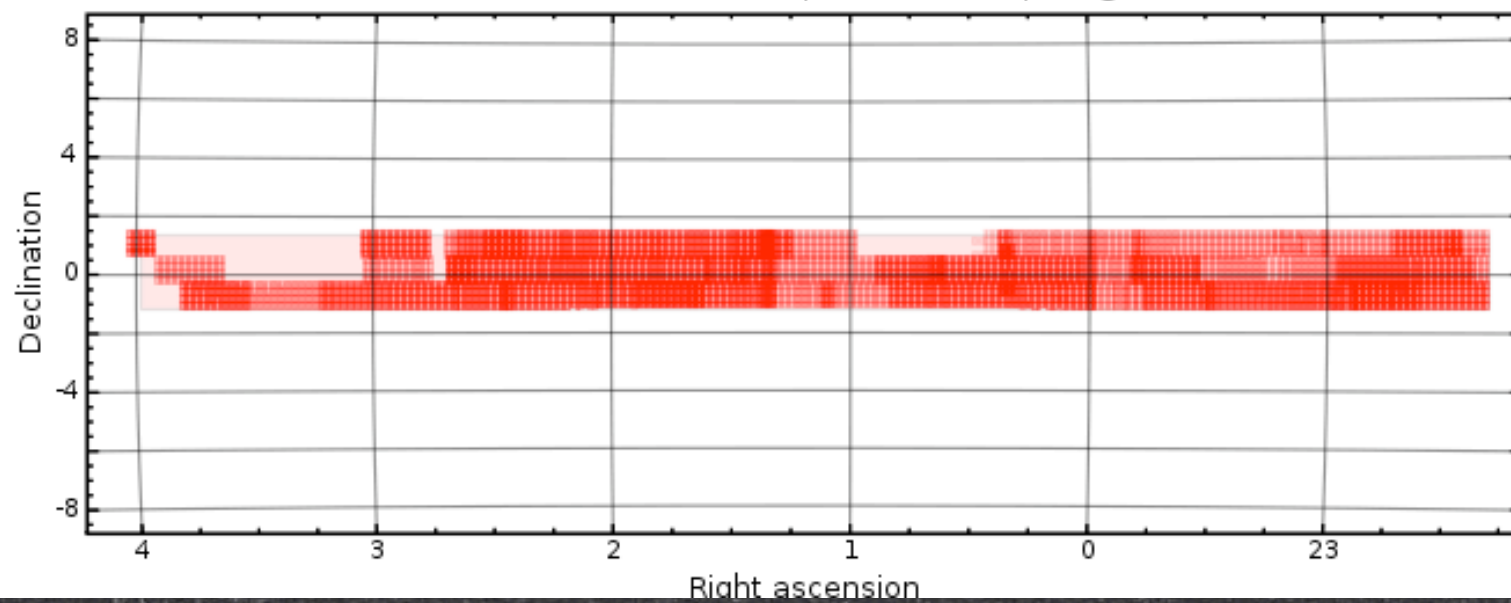
LAS Equatorial Block: 1907.6 sq. deg.



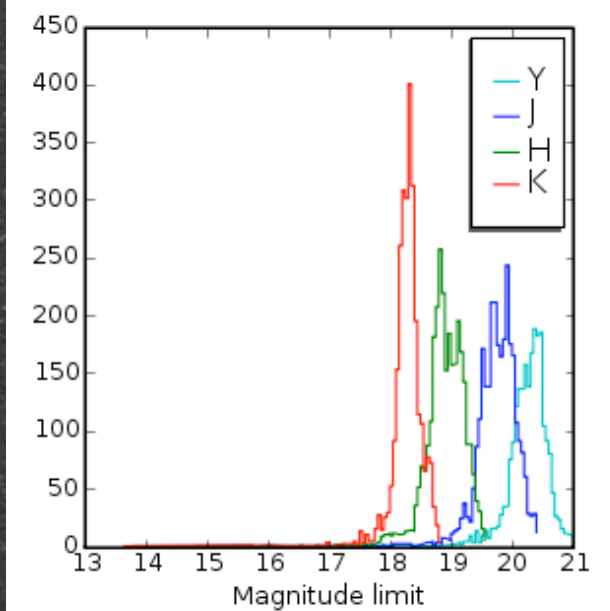
LAS Northern Block: 1907.6 sq. deg.



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

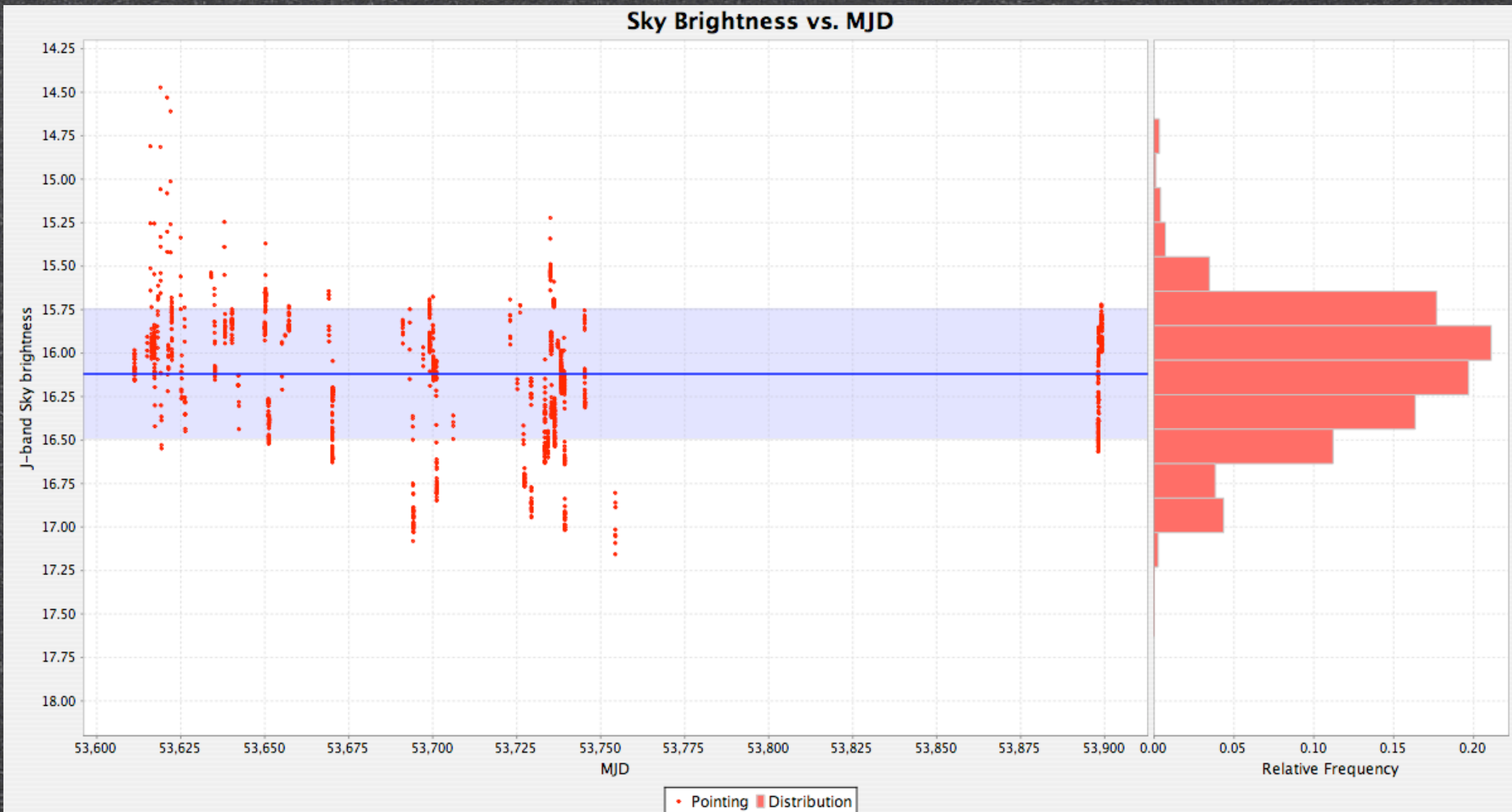


# Sky Brightness at Mauna Kea

(work in progress)



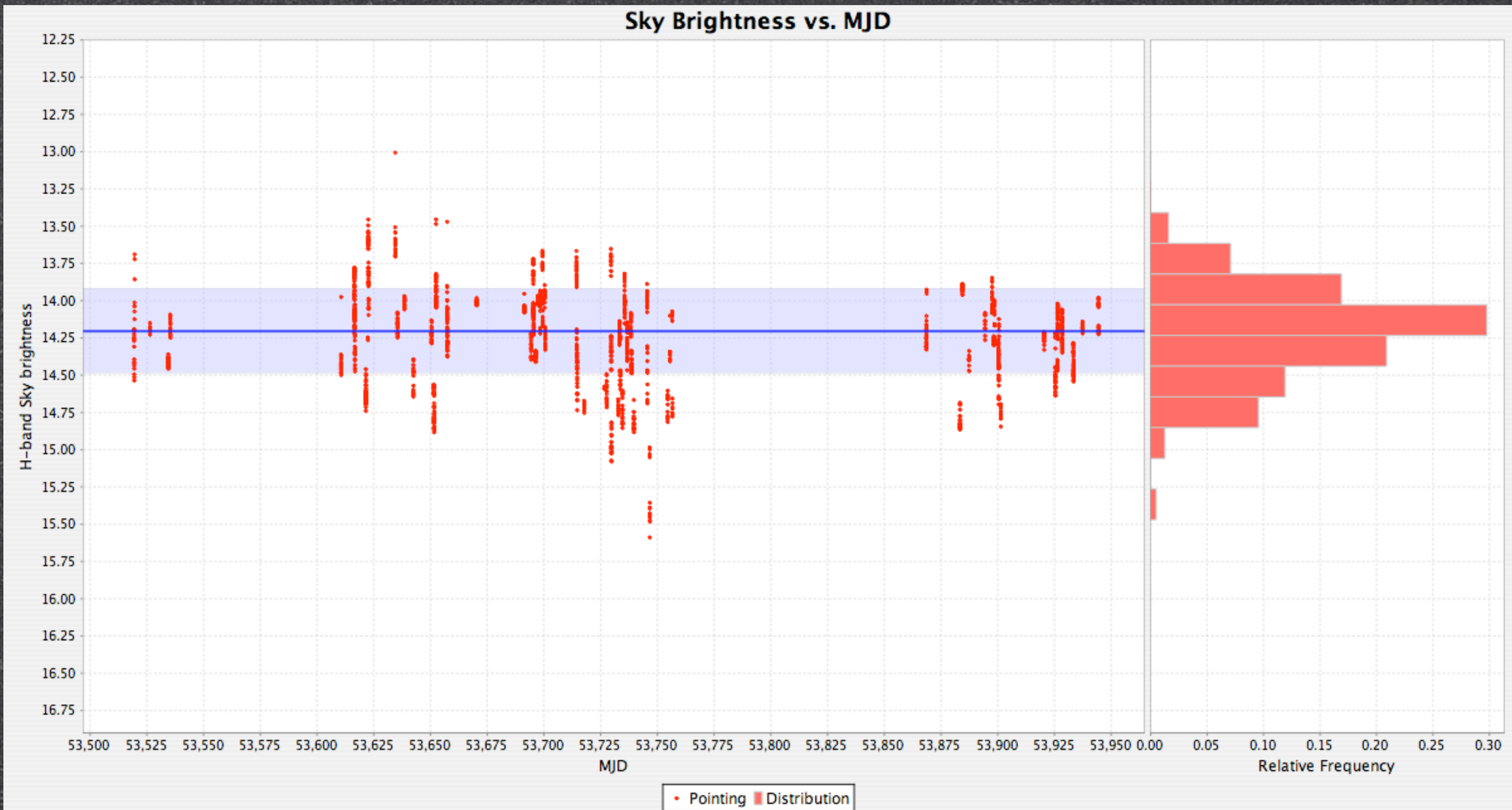
# Dark-time: J-band



$\text{sky}_J = 16.11 \text{ mag}$        $\sigma_J = 0.38 \text{ mag}$        $N = 1343$



# Dark-time: H band



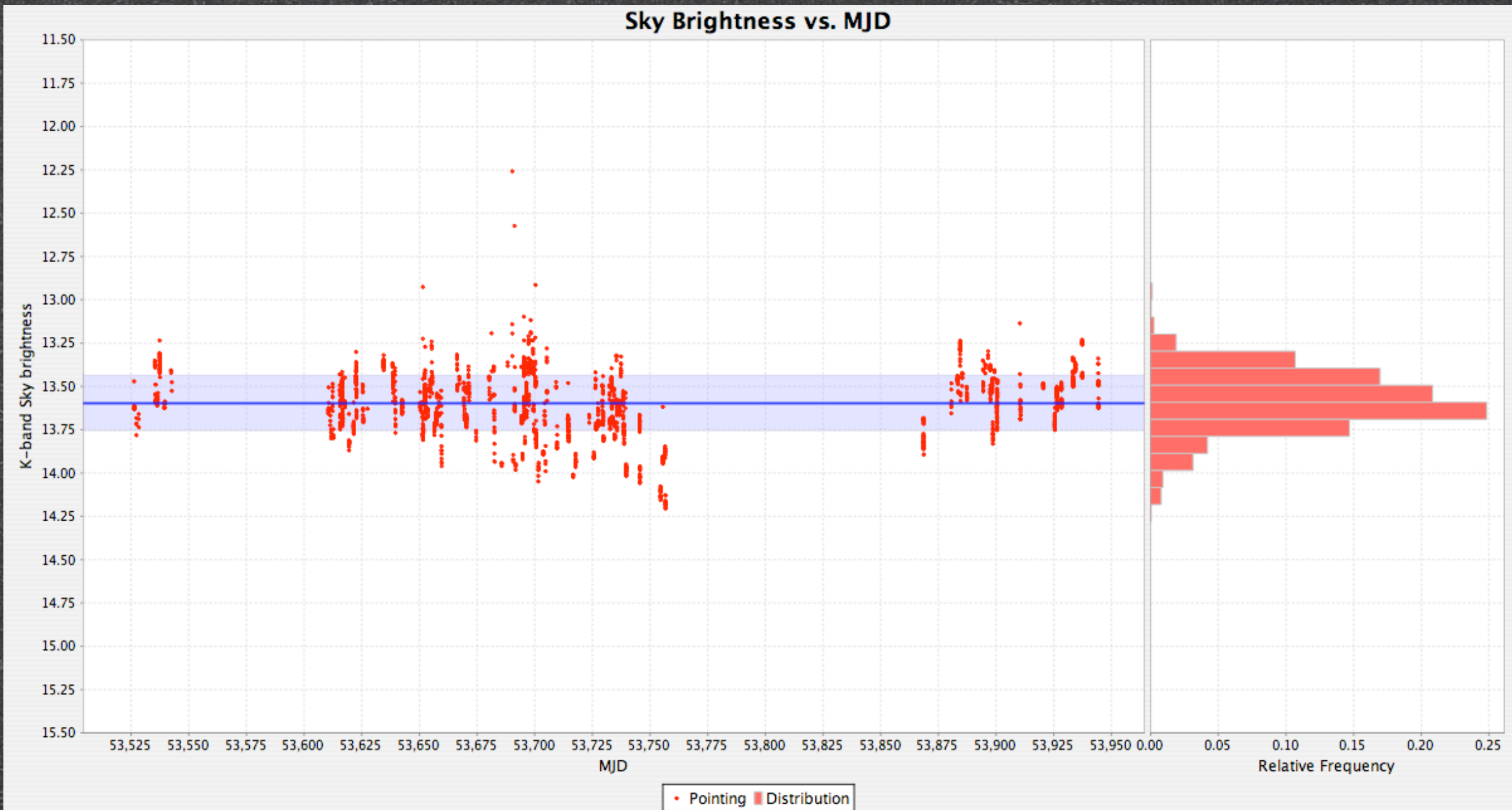
$\text{sky}_H = 14.20 \text{ mag}$

$\sigma_H = 0.29 \text{ mag}$

$N = 1824$



# Dark-time: K band



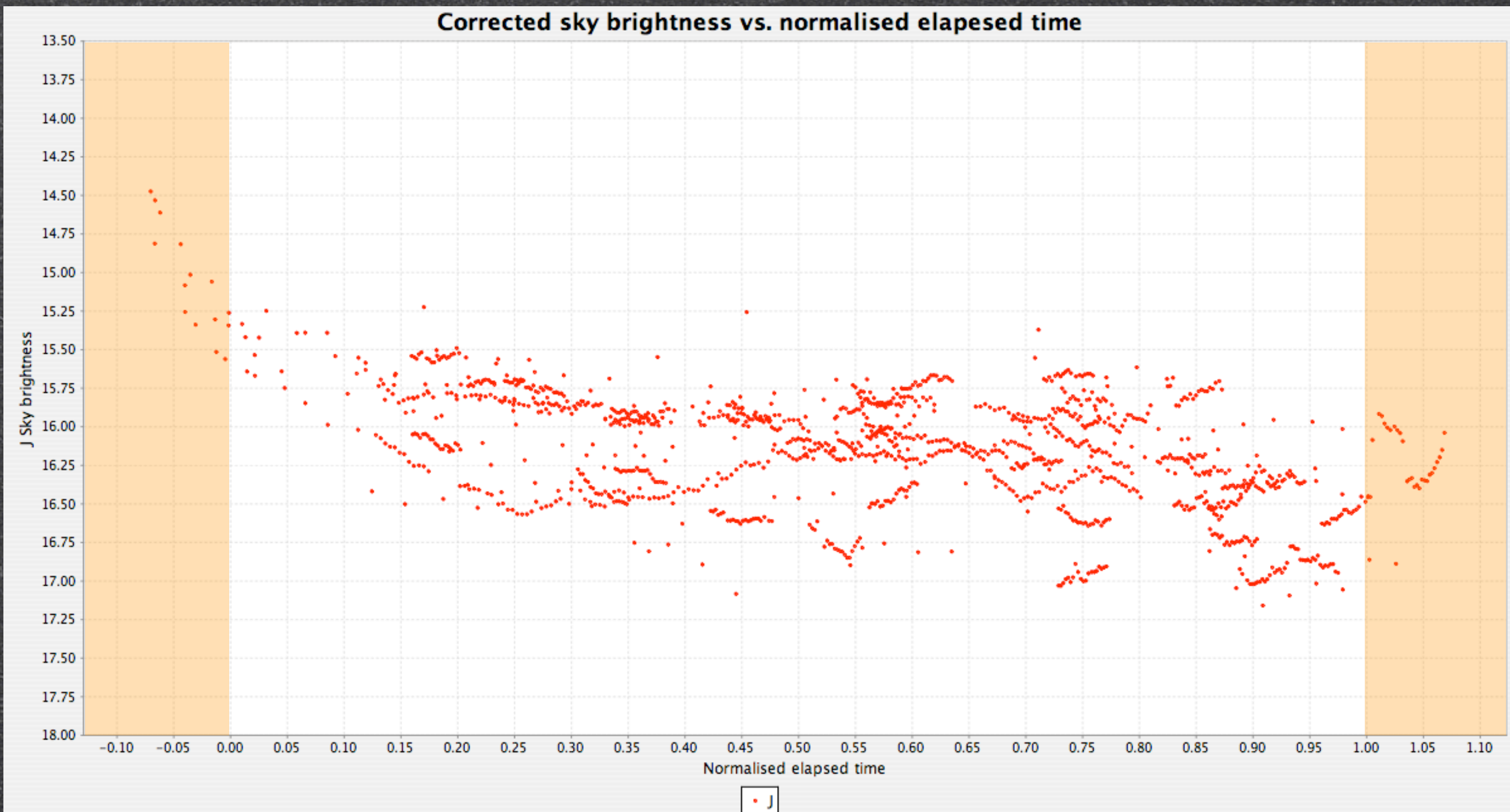
$\text{sky}_K = 13.59 \text{ mag}$

$\sigma_K = 0.16 \text{ mag}$

$N = 2423$

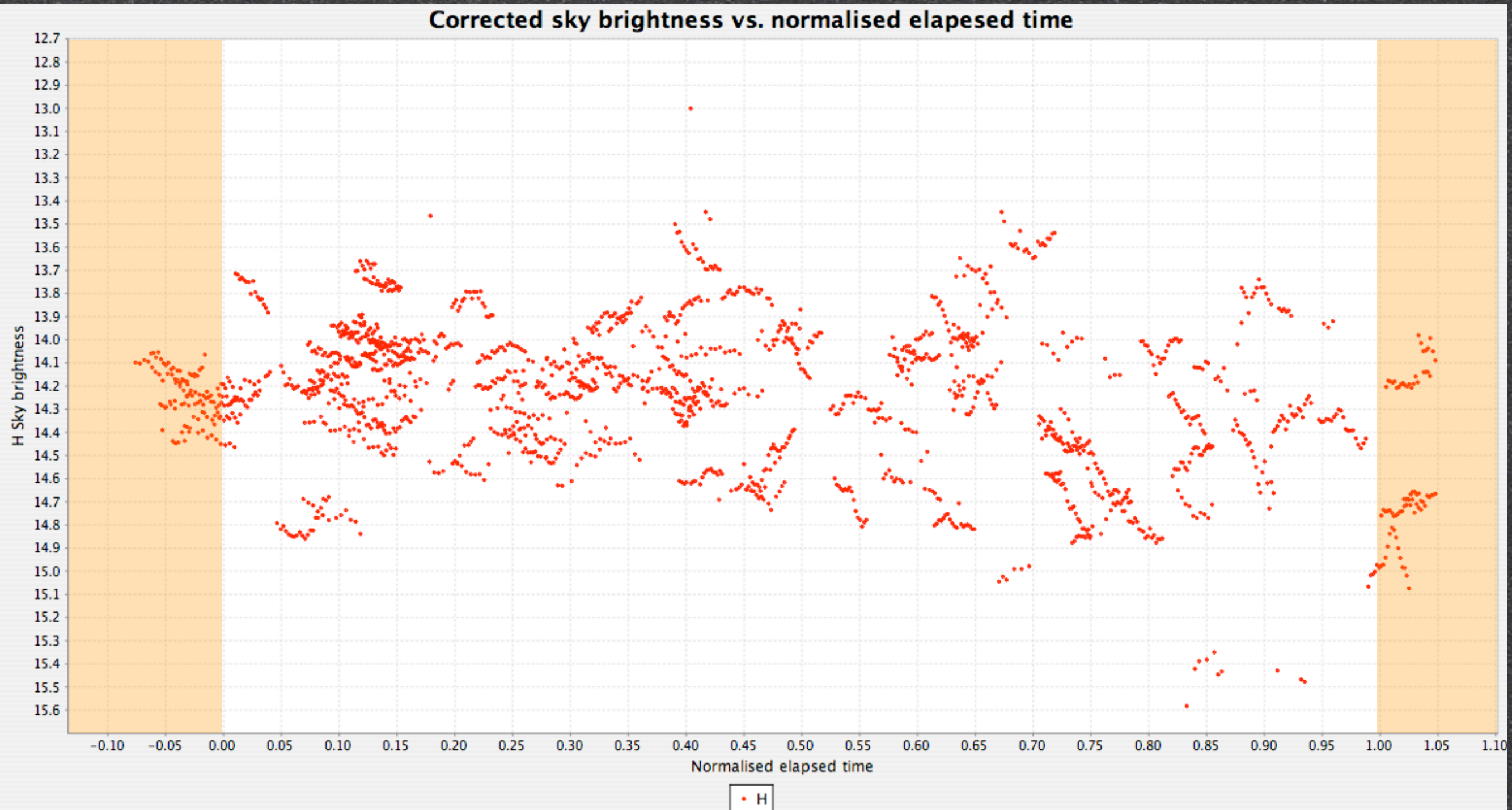


# Trends I - time J



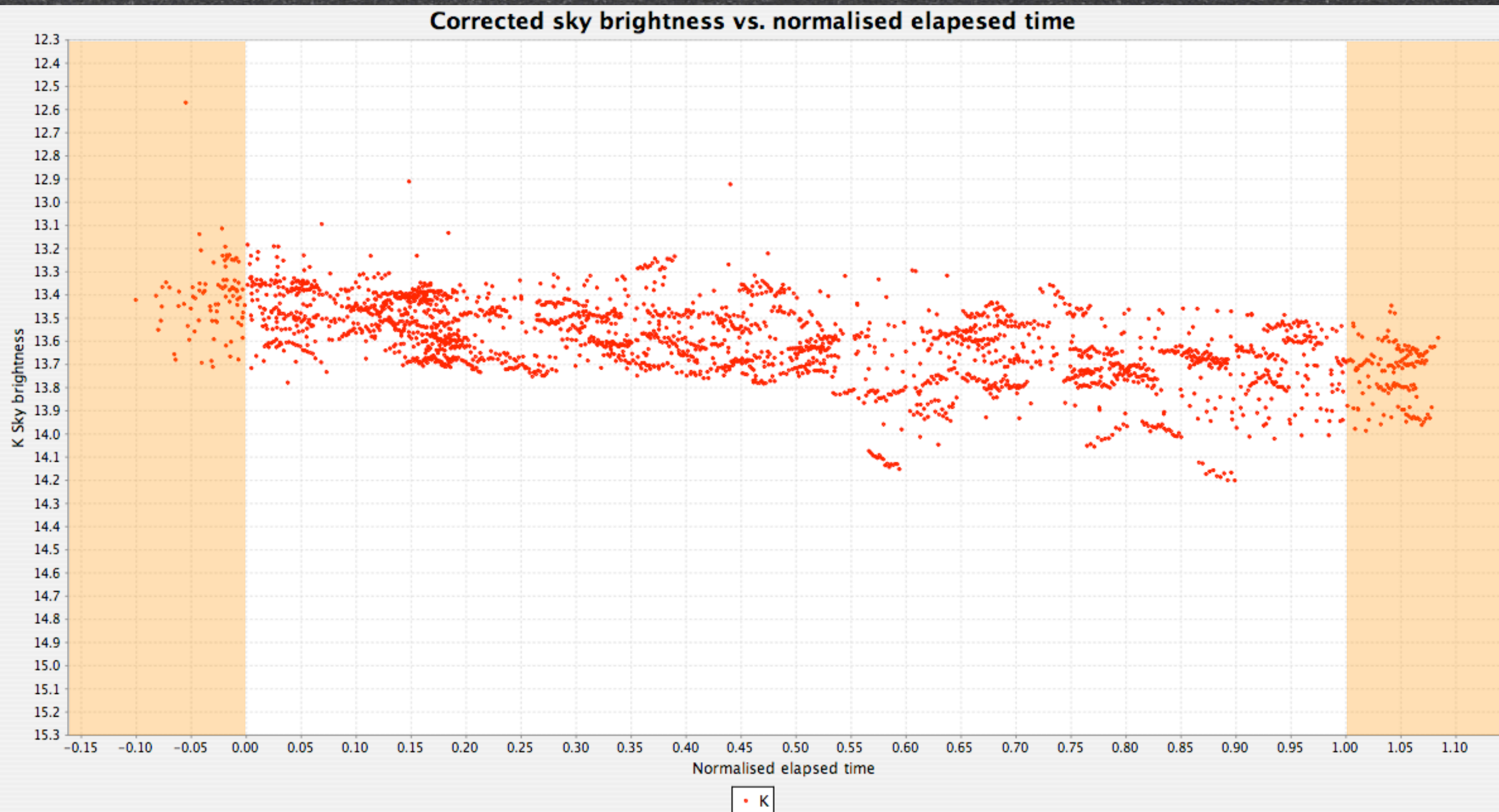


# Trends I – time H



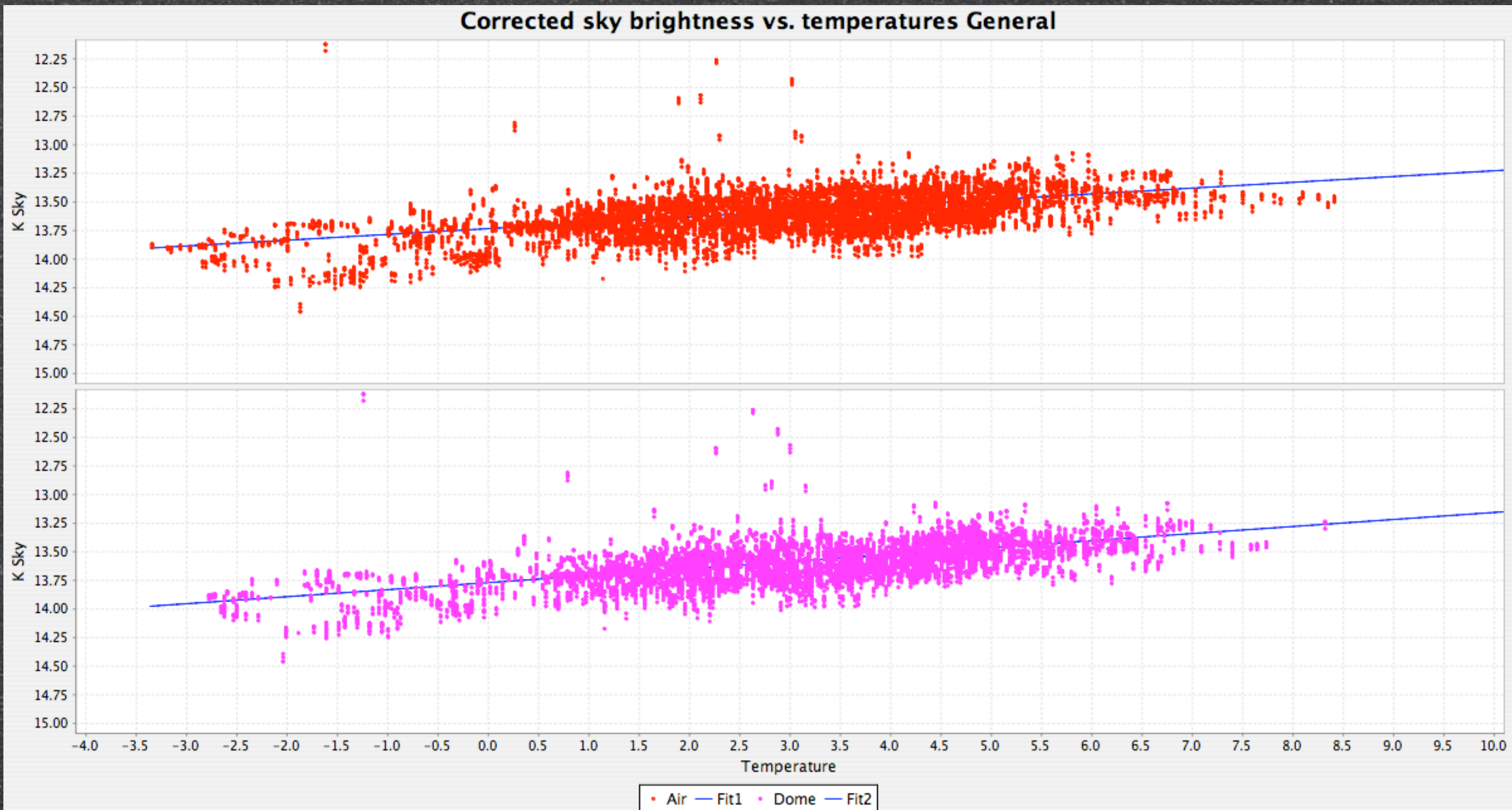


# Trends I - time K





# 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  $\sim 0.03$  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>