Photometric Surveys

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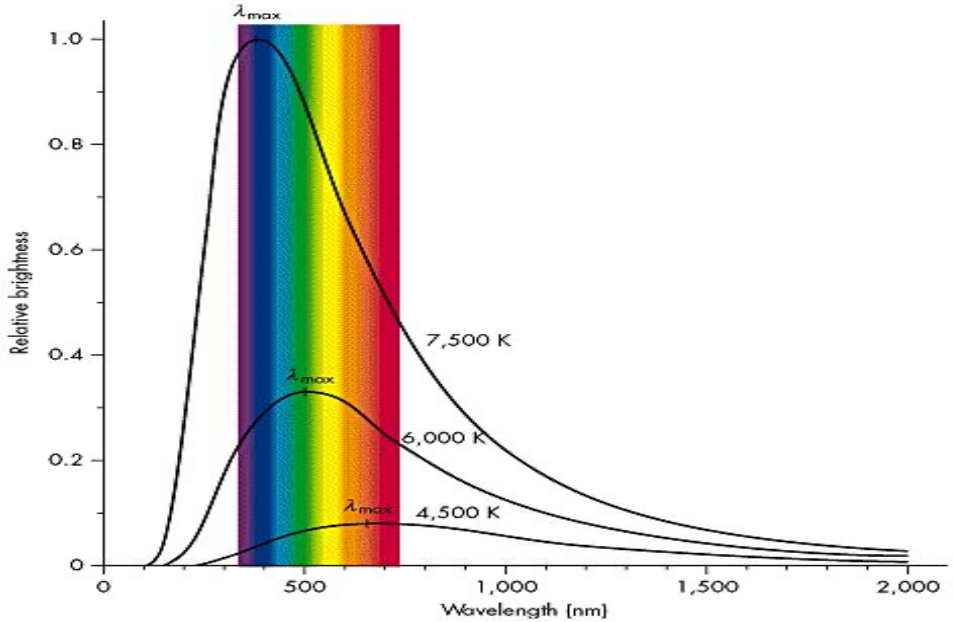
UNIVERSITY OF LEICESTER

Flux and Luminosity

Luminosity of a star is the amount of energy it emits into space per unit time

$$L = 4\pi R^2 \sigma T_{eff}^4 \quad \mathrm{J/s}$$



https://physics.weber.edu/palen/phsx1040/lectures/ltempmotion.html#q2

Power per unit area received from the object is the **flux**. At distance d:

$$F = \frac{L}{4\pi d^2} \qquad \mathrm{W\ m^{-2}}$$

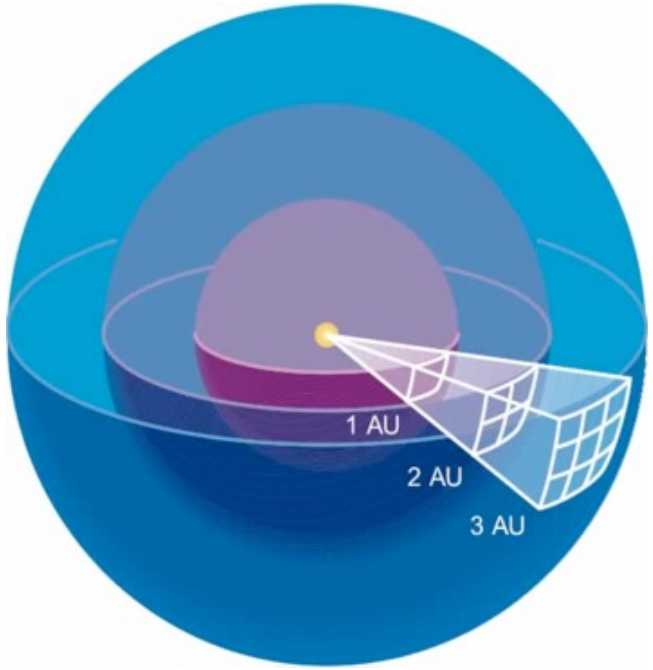


Figure: New Jersey Institute of Technology

Flux and Luminosity

Power per unit area received from the object is the **flux**. At distance d:

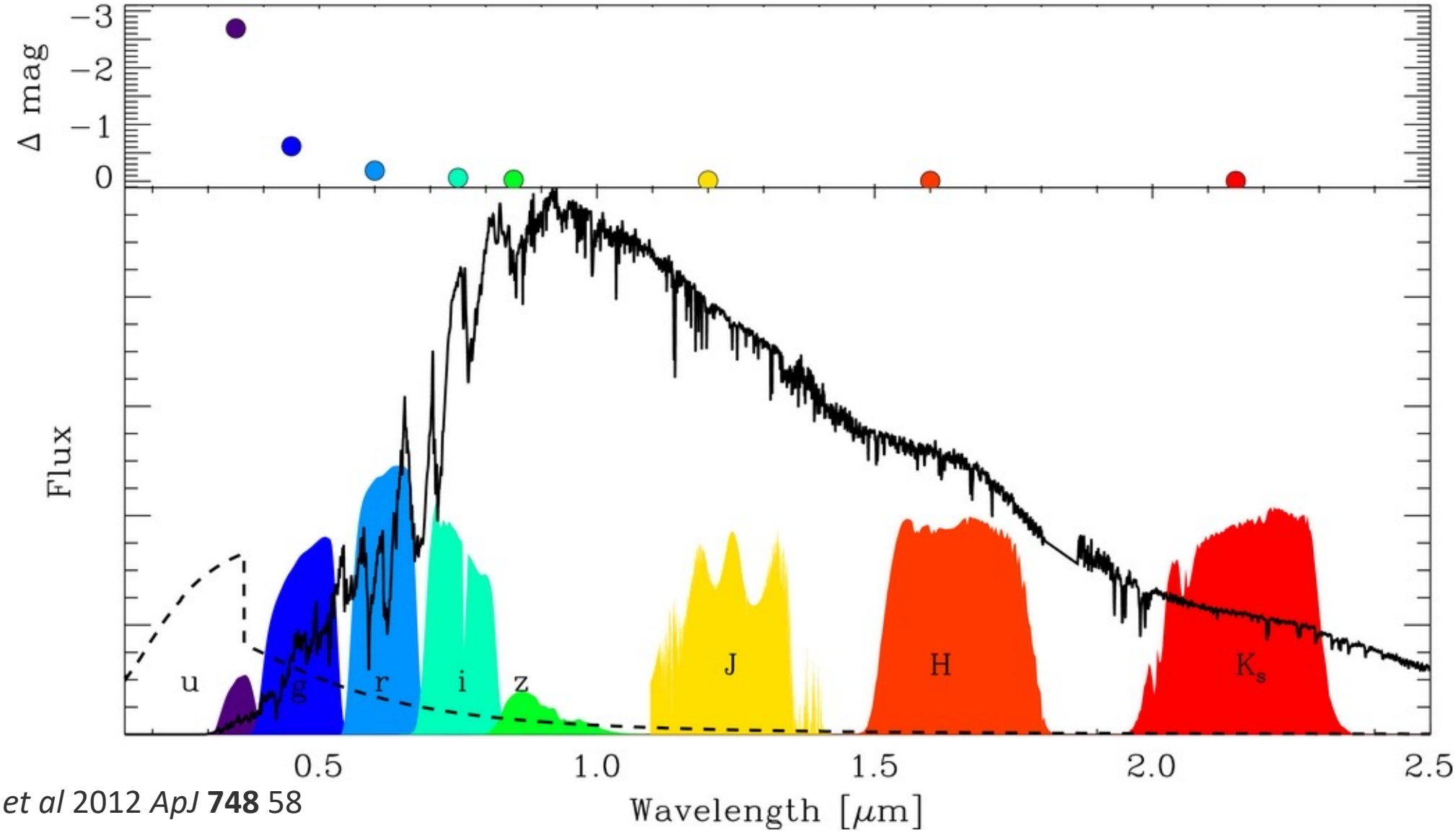
$$F = \frac{L}{4\pi d^2} \qquad \mathrm{W\ m^{-2}}$$

But archives give magnitudes not flux!

$$m_1 - m_2 = -2.5 \log_{10} \frac{F_1}{F_2}$$

Set m_1 to zero, and F1 to zeropoint

Filter profiles: common ground based



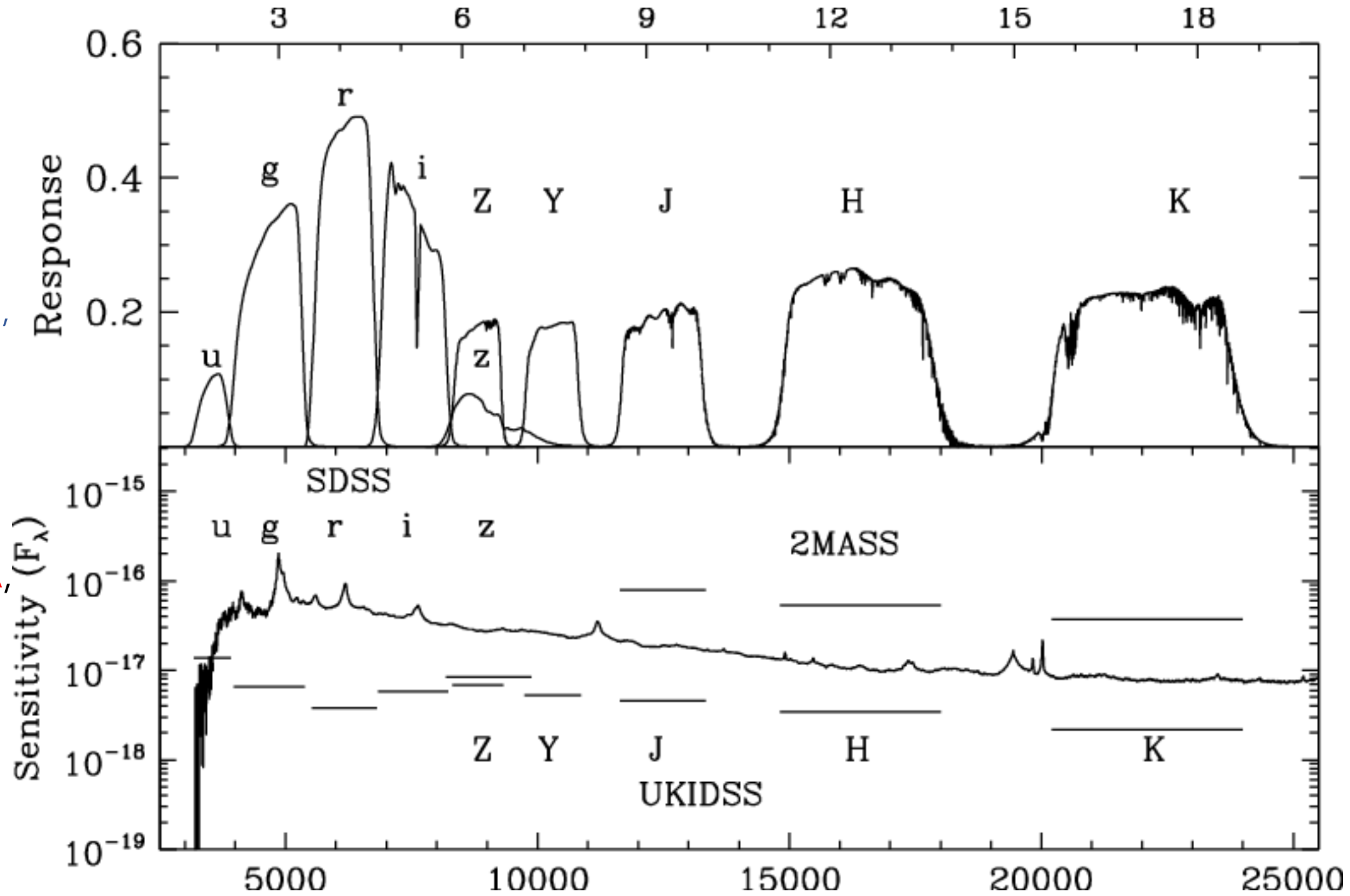
Davenport *et al* 2012 *ApJ* **748** 58

Filters

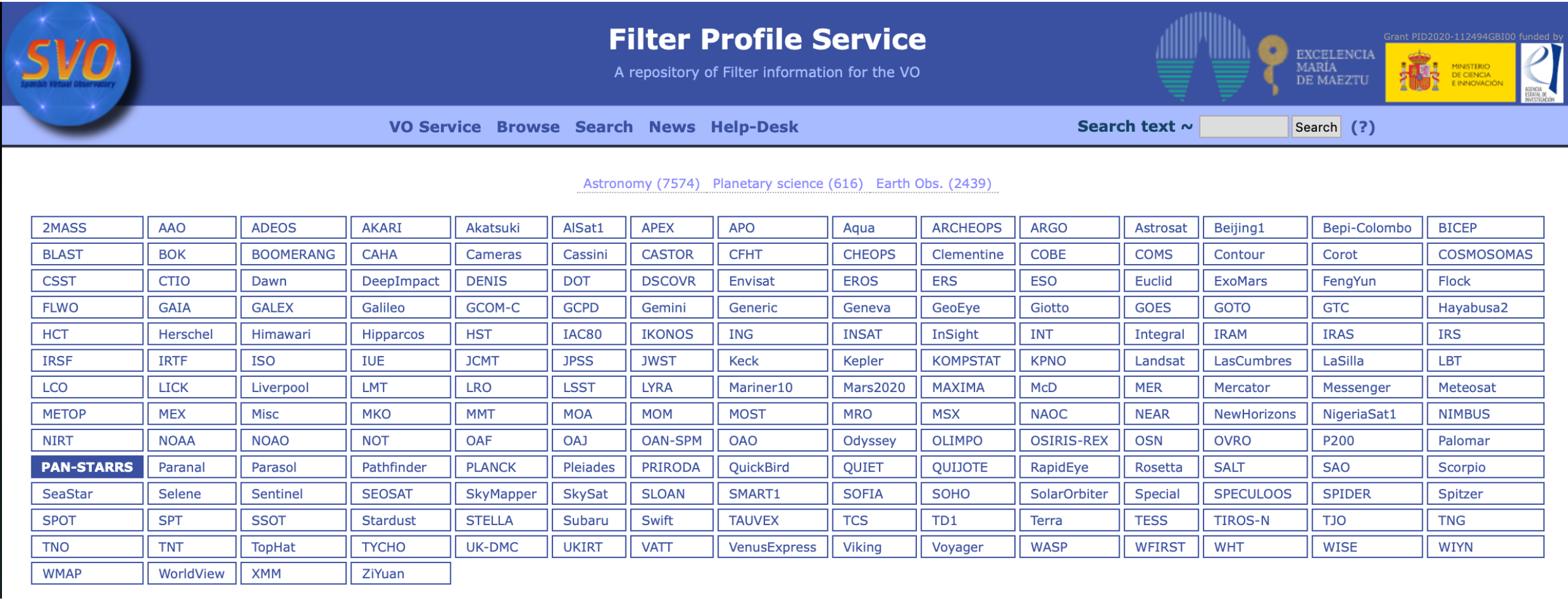
Optical
SDSS, APASS,
DES, Panstarrs,
USNO, UCAC,
VST

NIR
2MASS, Denis,
UKIDSS, VISTA,

MIR
WISE, Spitzer,
JWST



Filter profiles: SVO!



Zeropoint – flux of a zero mag star

PAN-STARRS/PS1.g

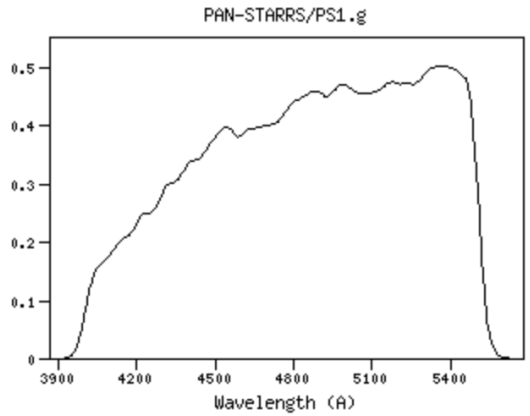
Filter Description

Filter ID (?) :	PAN-STARRS/PS1.g
Description (?) :	PS1 g filter
Phot.System (?) :	PAN-STARRS
Detector Type (?) :	Photon counter
Band Name (?) :	g
Obs. Facility (?) :	PAN-STARRS
Instrument (?) :	PAN-STARRS
Comments (?) :	Including the nominal 1.2 airmasses of the Pan-STARRS1 standard atmospheric extinction.

Mathematical properties

Property	Calculated	Specified	Unit
λ_{ref} (?) :	4849.11	-------	(Angstrom)
λ_{mean} (?) :	4900.12	-------	(Angstrom)
λ_{cen} (?) :	4936.01	-------	(Angstrom)
λ_{eff} (?) :	4810.16	-------	(Angstrom)
λ_{peak} (?) :	5390.00	-------	(Angstrom)
λ_{pivot} (?) :	4849.11	-------	(Angstrom)
λ_{phot} (?) :	4844.96	-------	(Angstrom)
λ_{min} (?) :	3949.50	-------	(Angstrom)
λ_{max} (?) :	5593.87	-------	(Angstrom)
W_{eff} (?) :	1053.08	-------	(Angstrom)
FWHM (?) :	1148.66	-------	(Angstrom)
A_f/A_V (?) :	1.17	-------	()
F_{sun} (?) :	189.41	-------	(erg/cm2/s/A)

Transmission



Data file: ascii, VOTable

Reference for filter response: U. Hawaii

Calibration properties

Vega System

Property	Specified	Calculated	Unit
Zero Point (?) :	-------	5.05397e-9	(erg/cm2/s/A)
	-------	3964.03	(Jy)
ZP Type (?) :	Pogson		
PhotCal ID (?) :	PAN-STARRS/PS1.g/Vega		

AB System

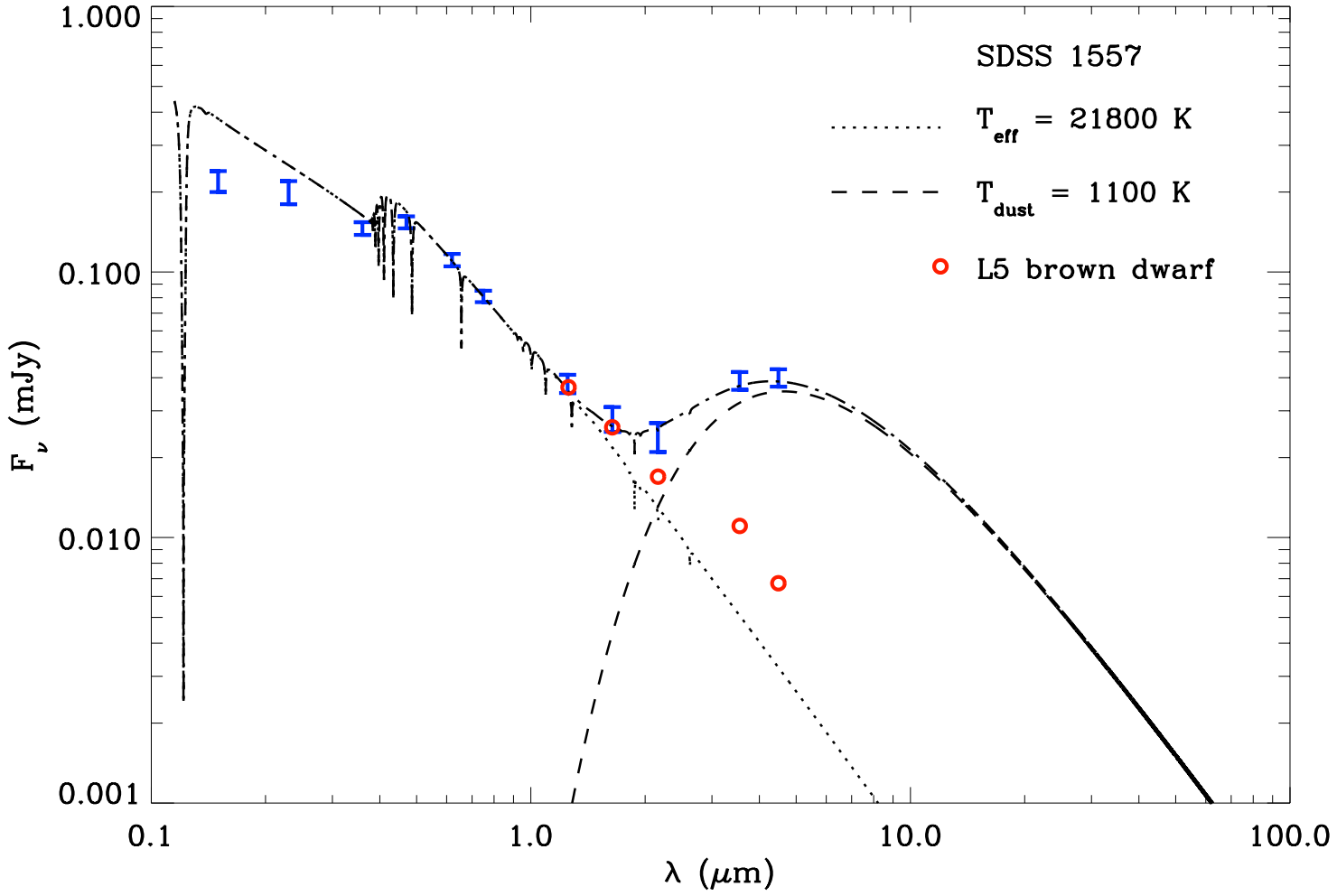
Property	Specified	Calculated	Unit
Zero Point (?) :	-------	4.62937e-9	(erg/cm2/s/A)
	-------	3631.00	(Jy)
ZP Type (?) :	Pogson		
PhotCal ID (?) :	PAN-STARRS/PS1.g/AB		

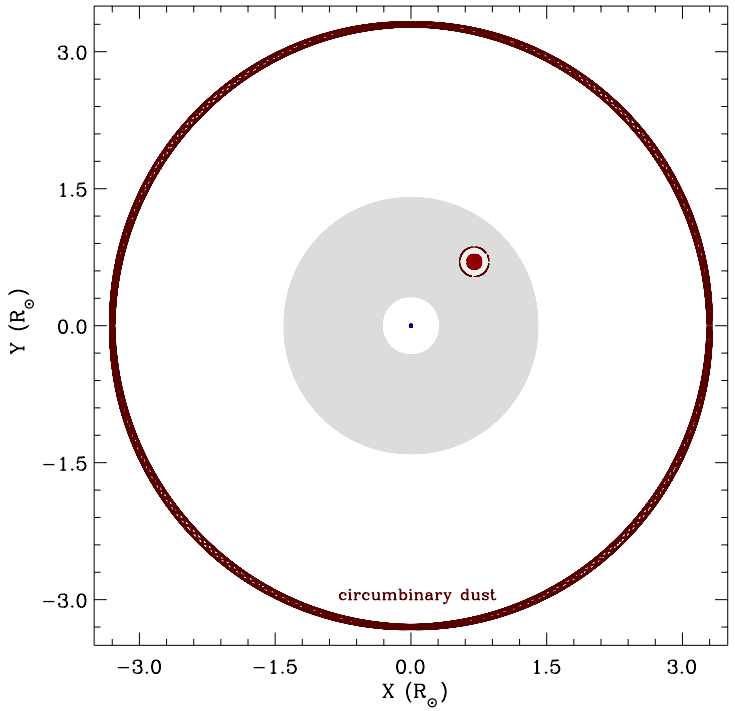
ST System

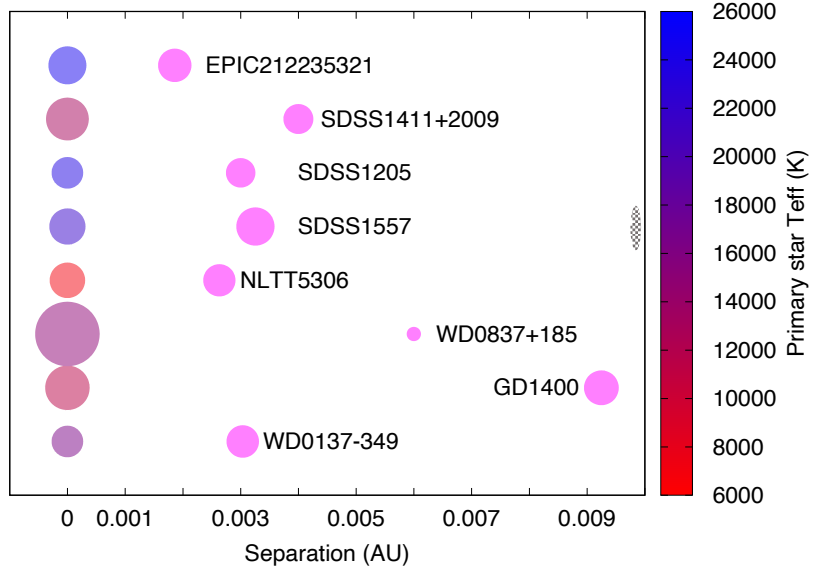
Property	Specified	Calculated	Unit

Check mags!!
Vega or AB

Photometry compared to spectrum



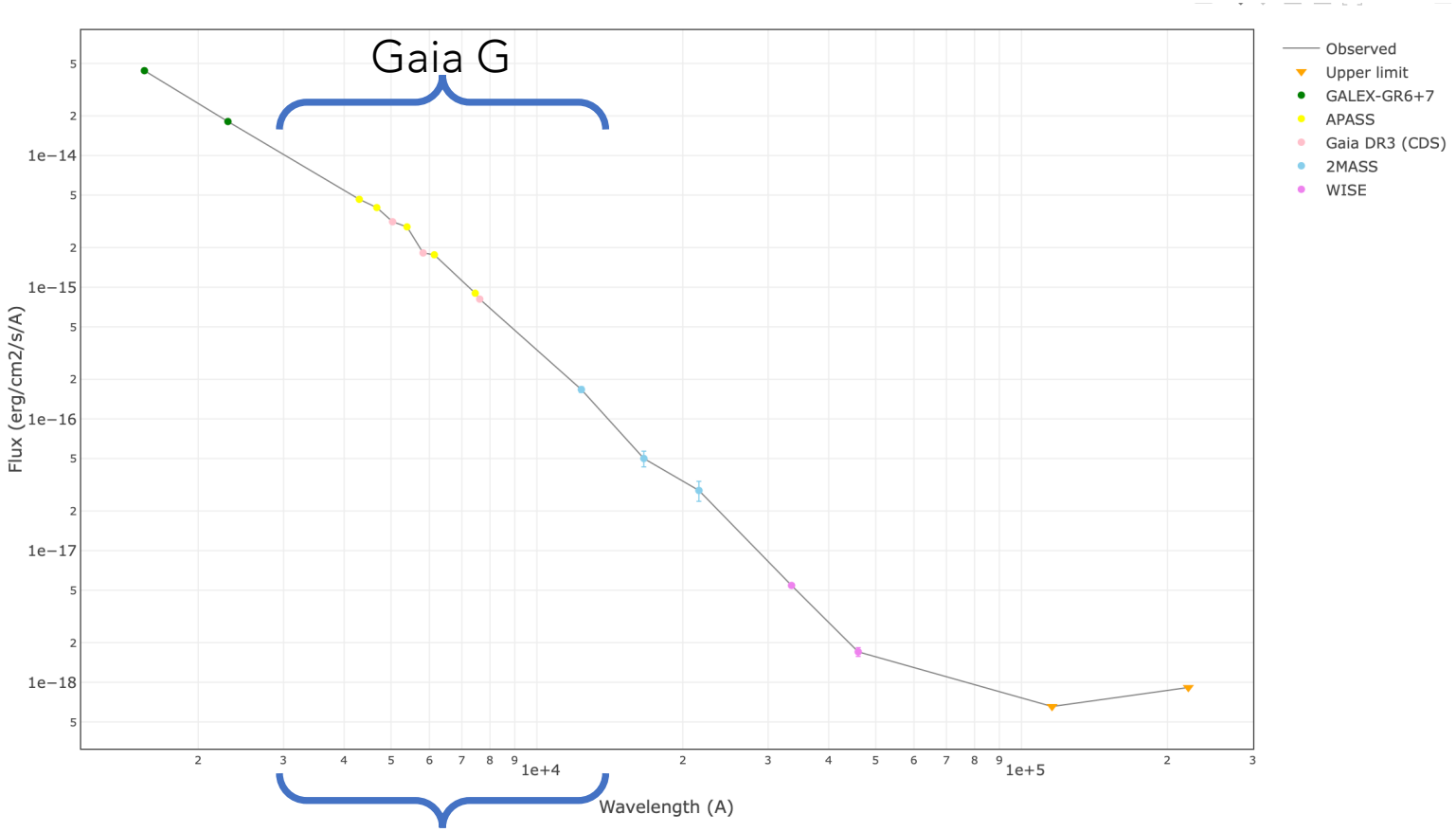


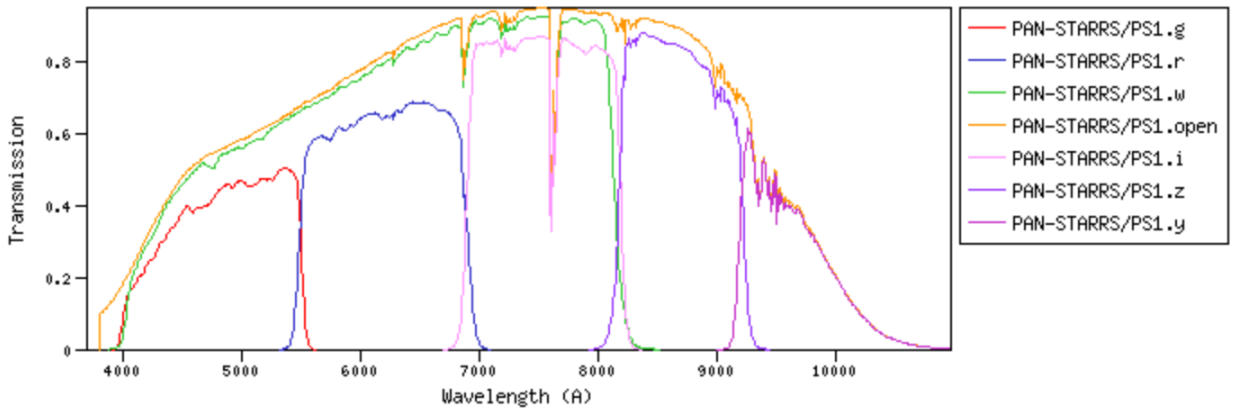


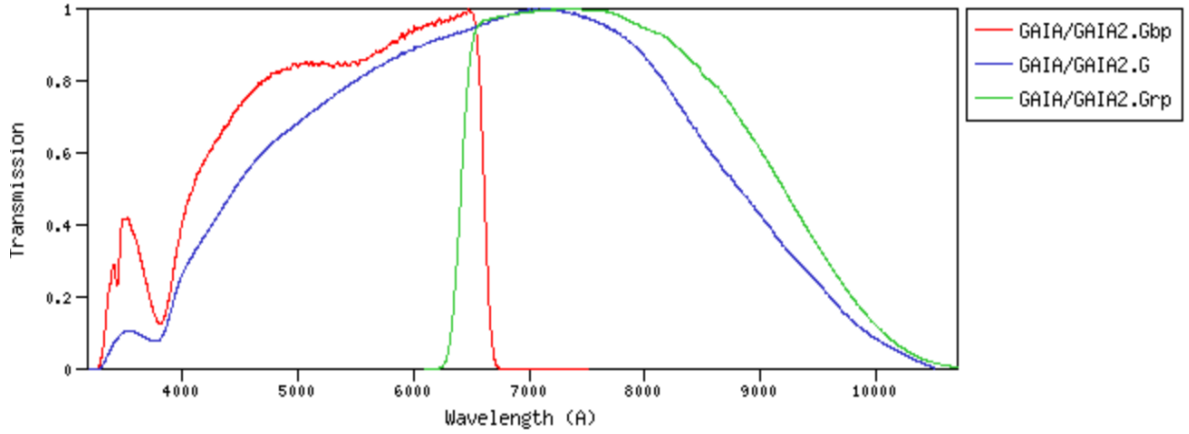
Farihi et al., 2016

Passbands – caution!

Gaia filters are HUGE
Not best option for SEDs







Passbands – caution!

GaiaDR3 J-PAS Synt.Phot.

Gaia DR3 J-PAS Synt.Phot. Synthetic photometry in the J-PAS bands obtained from the Gaia DR3 BP/RP spectra using the GaiaXPy tool.

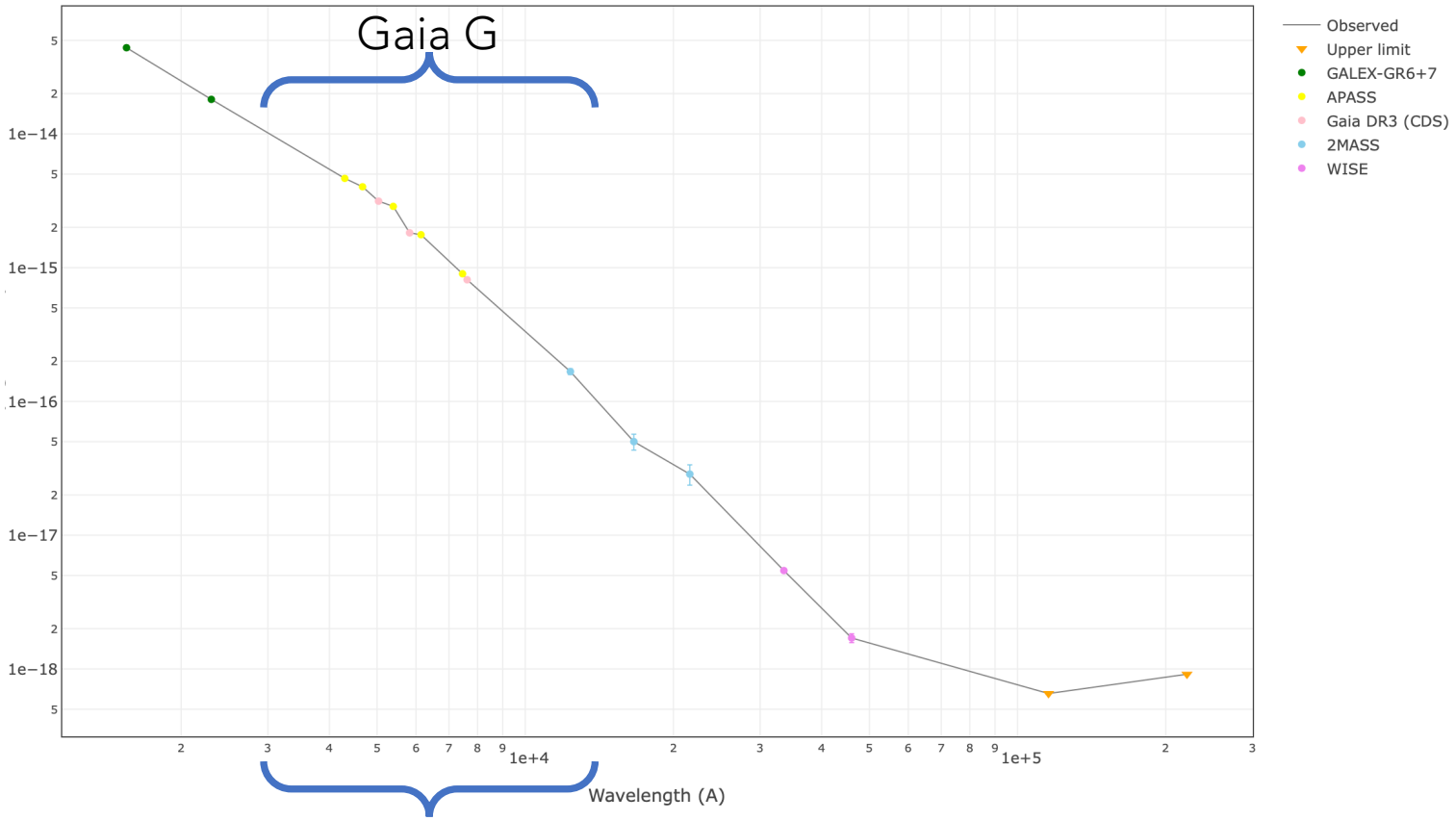
More Info.

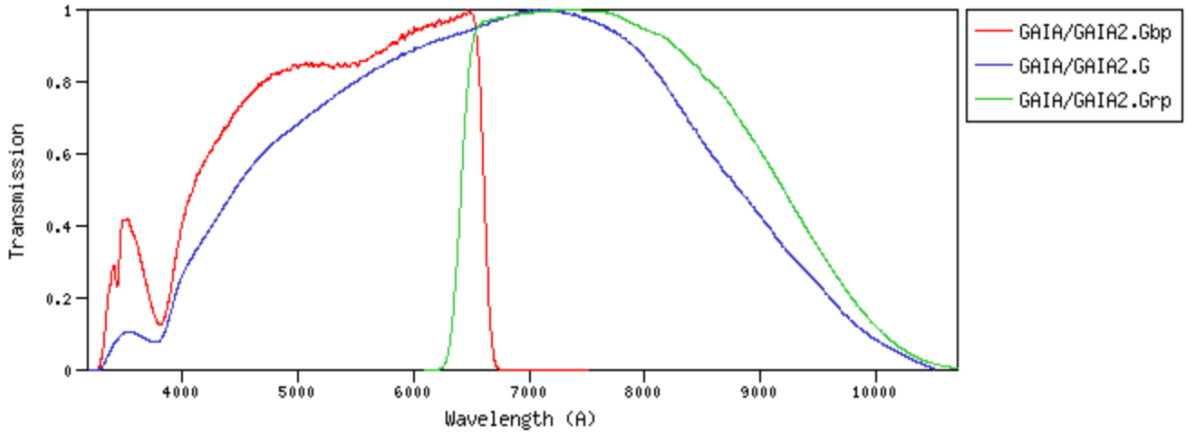
Filters:

OAJ/JPLUS.uJAVA	OAJ/JPLUS.J0378	OAJ/JPLUS.J0395
OAJ/JPLUS.J0410	OAJ/JPLUS.J0430	OAJ/JPLUS.gSDSS
OAJ/JPLUS.J0515	OAJ/JPLUS.rSDSS	OAJ/JPLUS.J0660
OAJ/JPLUS.iSDSS	OAJ/JPLUS.J0861	OAJ/JPLUS.zSDSS
OAJ/JPAS.uJava	OAJ/JPAS.u	OAJ/JPAS.J0378
OAJ/JPAS.J0390	OAJ/JPAS.J0400	OAJ/JPAS.J0410
OAJ/JPAS.J0420	OAJ/JPAS.J0430	OAJ/JPAS.J0440
OAJ/JPAS.J0450	OAJ/JPAS.J0460	OAJ/JPAS.J0470
OAJ/JPAS.J0480	OAJ/JPAS.gSDSS	OAJ/JPAS.J0490
OAJ/JPAS.J0500	OAJ/JPAS.J0510	OAJ/JPAS.J0520
OAJ/JPAS.J0530	OAJ/JPAS.J0540	OAJ/JPAS.J0550
OAJ/JPAS.J0560	OAJ/JPAS.J0570	OAJ/JPAS.J0580
OAJ/JPAS.J0590	OAJ/JPAS.J0600	OAJ/JPAS.J0610
OAJ/JPAS.J0620	OAJ/JPAS.rSDSS	OAJ/JPAS.J0630
OAJ/JPAS.J0640	OAJ/JPAS.J0650	OAJ/JPAS.J0660
OAJ/JPAS.J0670	OAJ/JPAS.J0680	OAJ/JPAS.J0690
OAJ/JPAS.J0700	OAJ/JPAS.J0710	OAJ/JPAS.J0720
OAJ/JPAS.J0730	OAJ/JPAS.J0740	OAJ/JPAS.J0750
OAJ/JPAS.J0760	OAJ/JPAS.iSDSS	OAJ/JPAS.J0770
OAJ/JPAS.J0780	OAJ/JPAS.J0790	OAJ/JPAS.J0800
OAJ/JPAS.J0810	OAJ/JPAS.J0820	OAJ/JPAS.J0830
OAJ/JPAS.J0840	OAJ/JPAS.J0850	OAJ/JPAS.J0860
OAJ/JPAS.J0870	OAJ/JPAS.J0880	OAJ/JPAS.J0890
OAJ/JPAS.J0900	OAJ/JPAS.J0910	OAJ/JPAS.J1007

Search radius: 5 arcsec

Show flux limits





Passbands – caution!

Gaia G

GaiaDR3 J-PAS Synt.Phot.

Gaia DR3 J-PAS Synt.Phot. Synthetic photometry in the J-PAS bands obtained from the Gaia DR3 BP/RP spectra using the GaiaXPy tool.

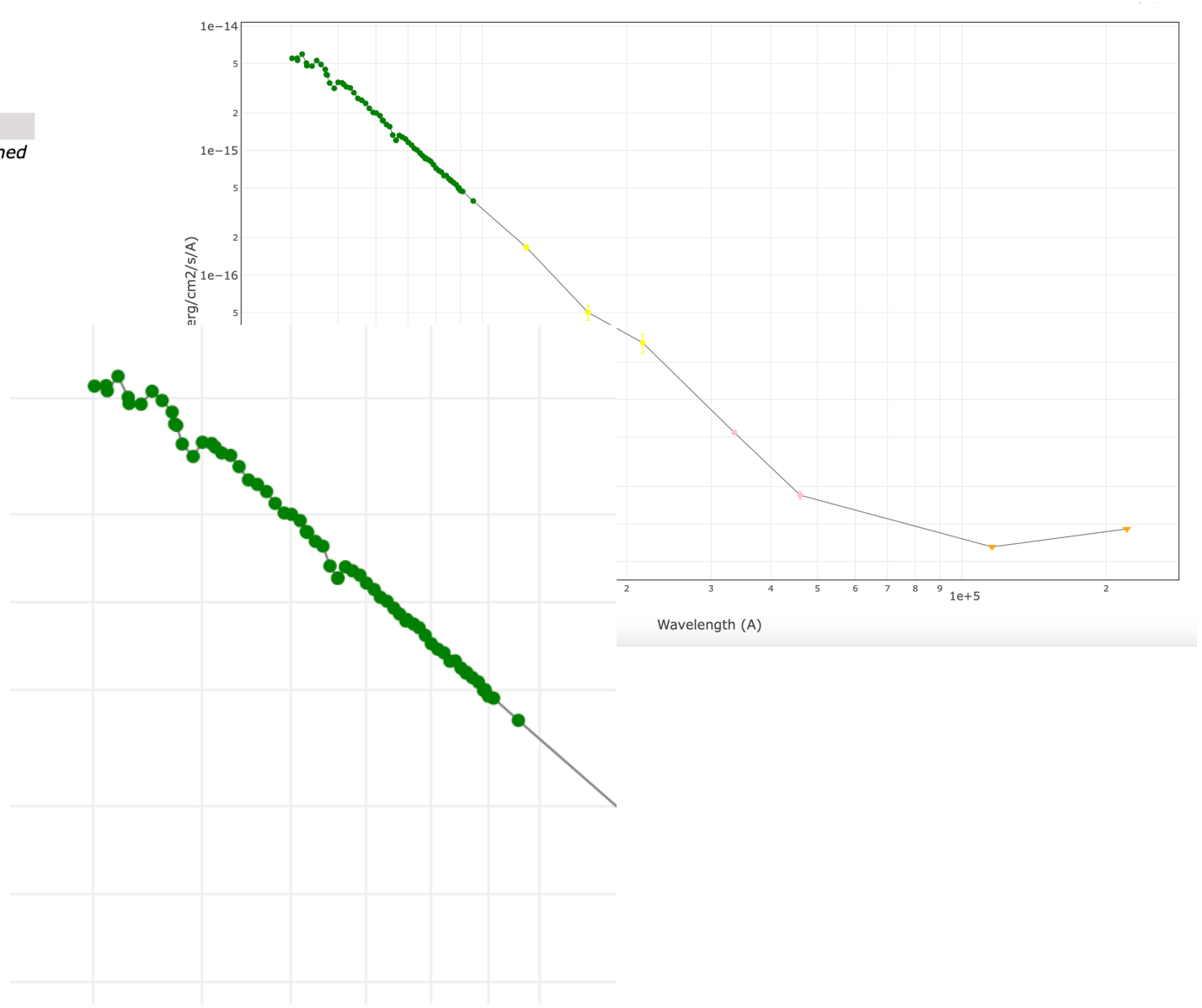
More Info.

Filters:

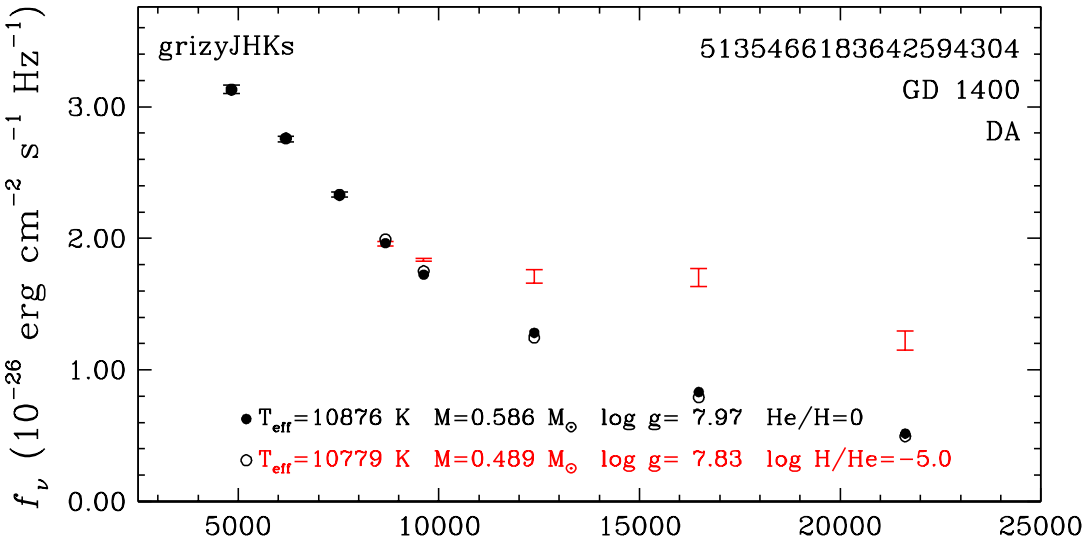
OAJ/JPLUS.uJAVA	OAJ/JPLUS.J0378	OAJ/JPLUS.J0395
OAJ/JPLUS.J0410	OAJ/JPLUS.J0430	OAJ/JPLUS.gSDSS
OAJ/JPLUS.J0515	OAJ/JPLUS.rSDSS	OAJ/JPLUS.J0660
OAJ/JPLUS.iSDSS	OAJ/JPLUS.J0861	OAJ/JPLUS.zSDSS
OAJ/JPAS.uJava	OAJ/JPAS.u	OAJ/JPAS.J0378
OAJ/JPAS.J0390	OAJ/JPAS.J0400	OAJ/JPAS.J0410
OAJ/JPAS.J0420	OAJ/JPAS.J0430	OAJ/JPAS.J0440
OAJ/JPAS.J0450	OAJ/JPAS.J0460	OAJ/JPAS.J0470
OAJ/JPAS.J0480	OAJ/JPAS.gSDSS	OAJ/JPAS.J0490
OAJ/JPAS.J0500	OAJ/JPAS.J0510	OAJ/JPAS.J0520
OAJ/JPAS.J0530	OAJ/JPAS.J0540	OAJ/JPAS.J0550
OAJ/JPAS.J0560	OAJ/JPAS.J0570	OAJ/JPAS.J0580
OAJ/JPAS.J0590	OAJ/JPAS.J0600	OAJ/JPAS.J0610
OAJ/JPAS.J0620	OAJ/JPAS.rSDSS	OAJ/JPAS.J0630
OAJ/JPAS.J0640	OAJ/JPAS.J0650	OAJ/JPAS.J0660
OAJ/JPAS.J0670	OAJ/JPAS.J0680	OAJ/JPAS.J0690
OAJ/JPAS.J0700	OAJ/JPAS.J0710	OAJ/JPAS.J0720
OAJ/JPAS.J0730	OAJ/JPAS.J0740	OAJ/JPAS.J0750
OAJ/JPAS.J0760	OAJ/JPAS.iSDSS	OAJ/JPAS.J0770
OAJ/JPAS.J0780	OAJ/JPAS.J0790	OAJ/JPAS.J0800
OAJ/JPAS.J0810	OAJ/JPAS.J0820	OAJ/JPAS.J0830
OAJ/JPAS.J0840	OAJ/JPAS.J0850	OAJ/JPAS.J0860
OAJ/JPAS.J0870	OAJ/JPAS.J0880	OAJ/JPAS.J0890
OAJ/JPAS.J0900	OAJ/JPAS.J0910	OAJ/JPAS.J1007

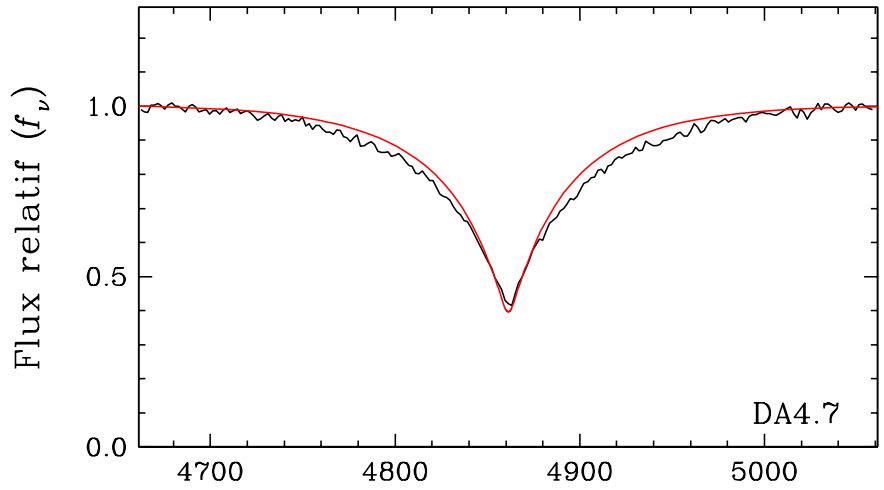
Search radius: 5 arcsec

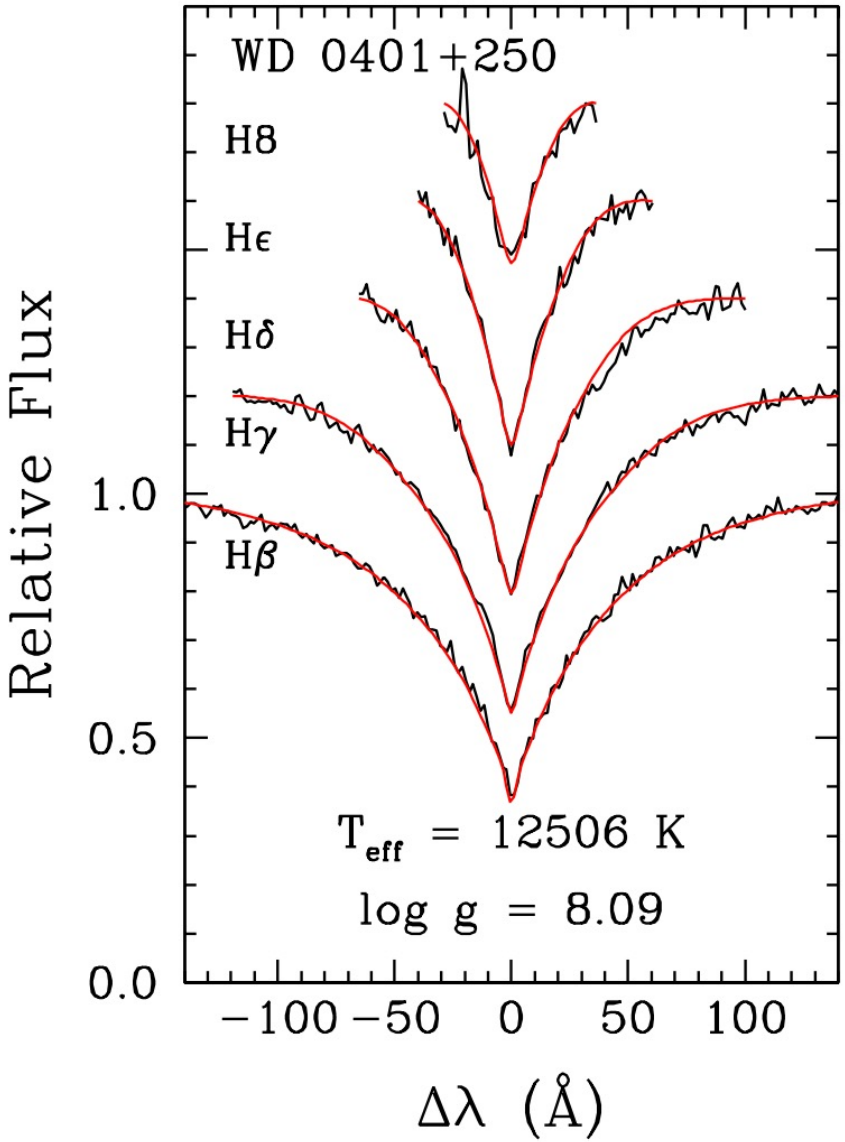
Show flux limits



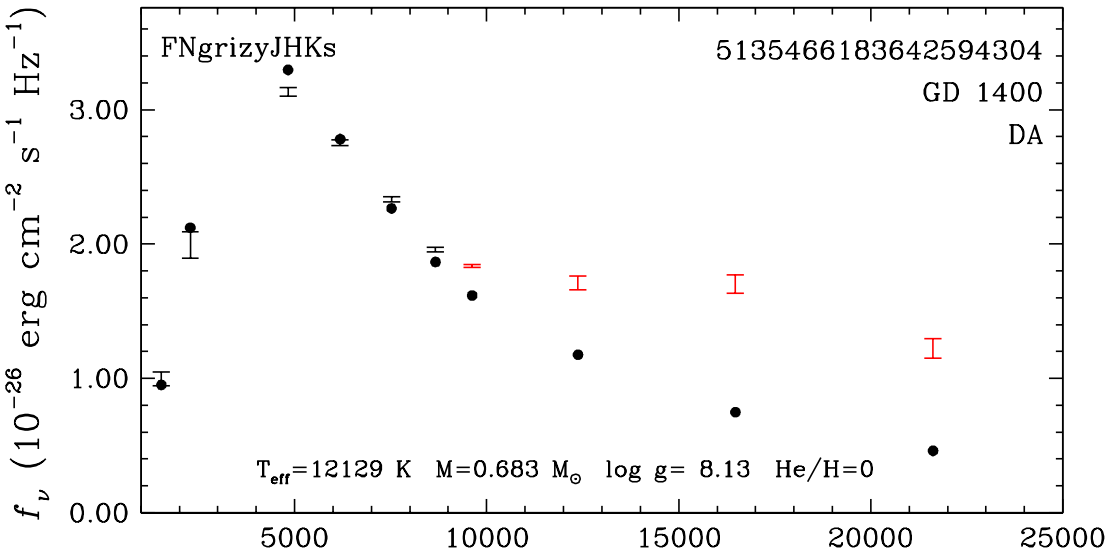
Case study: Photometric vs Spectroscopic effective temperature

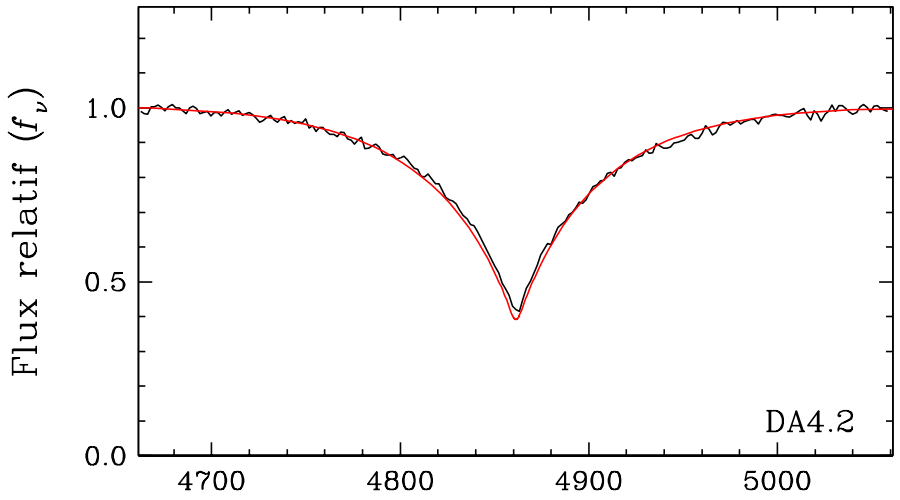


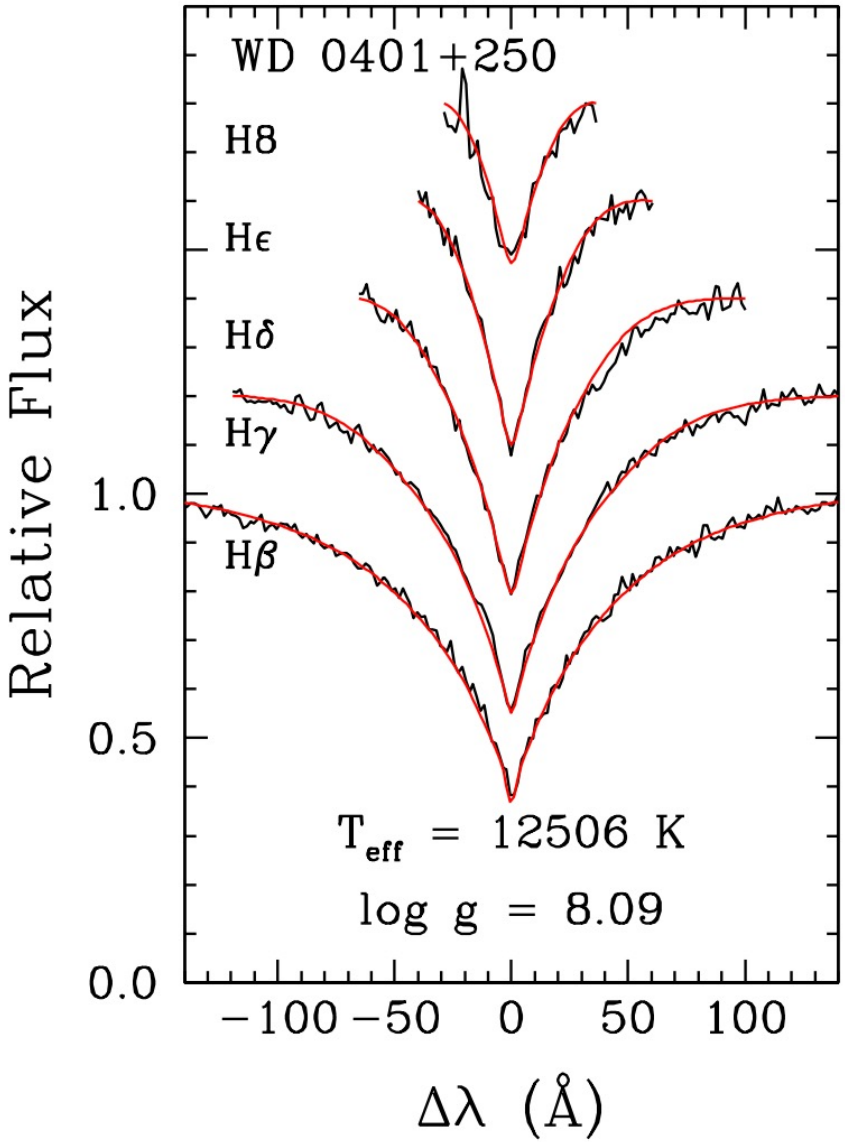




Case study: Photometric vs Spectroscopic effective temperature

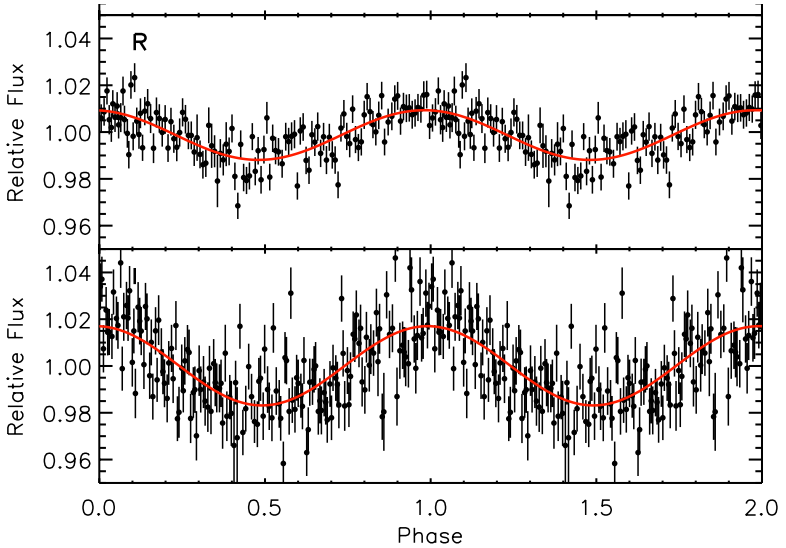






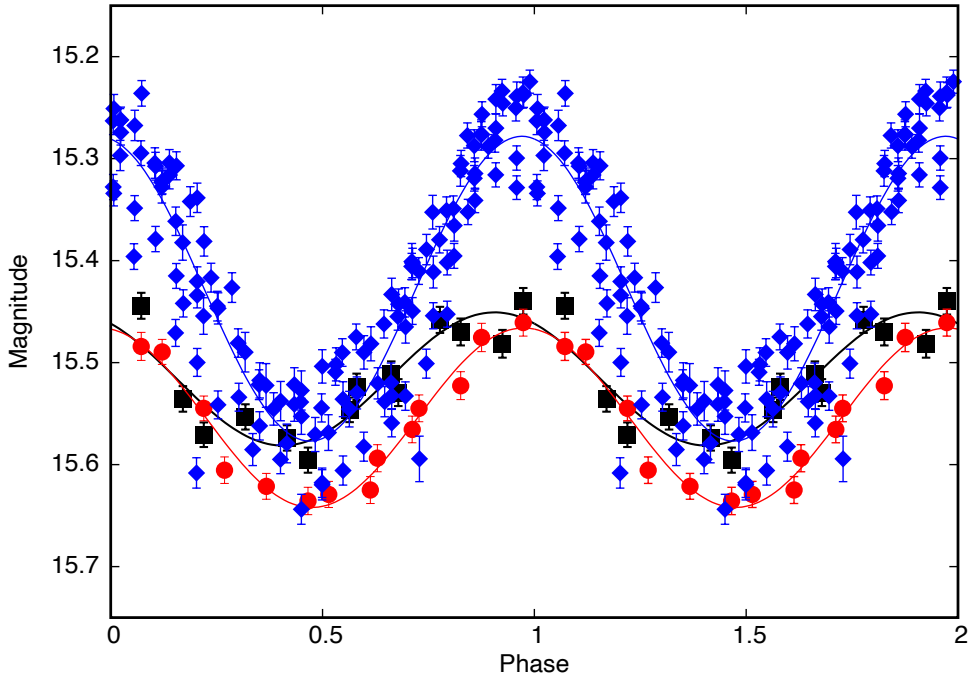
Time-series photometry

- WD+L6-L8
- $0.4M_{sun}$+ 53 M_{Jup}
- P=116 Min
- WD T_{eff}= 16500 K
- Halpha emission
- Metal emission
- Day-night diff ~500K

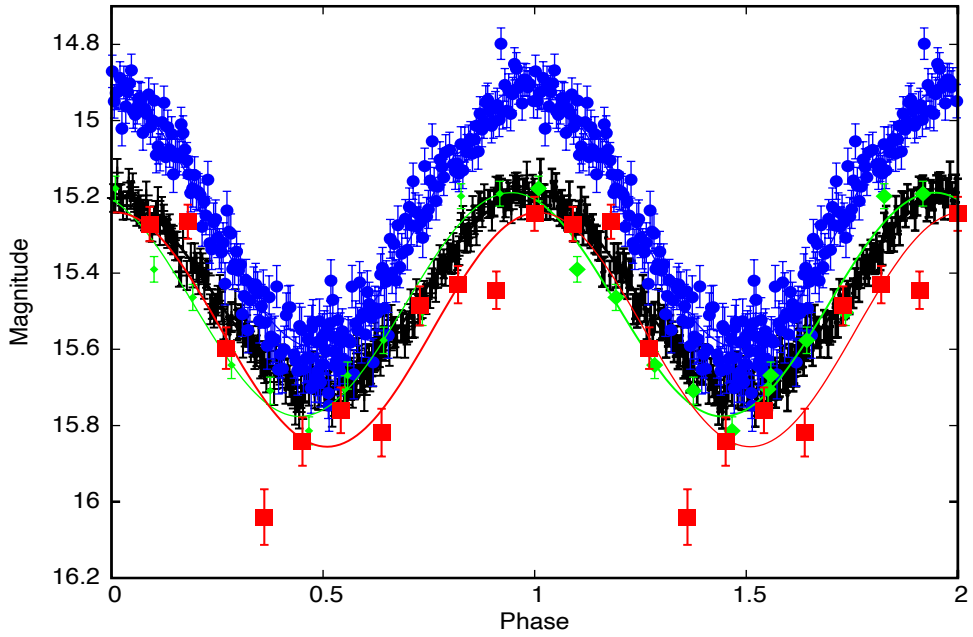


Casewell et al., 2015

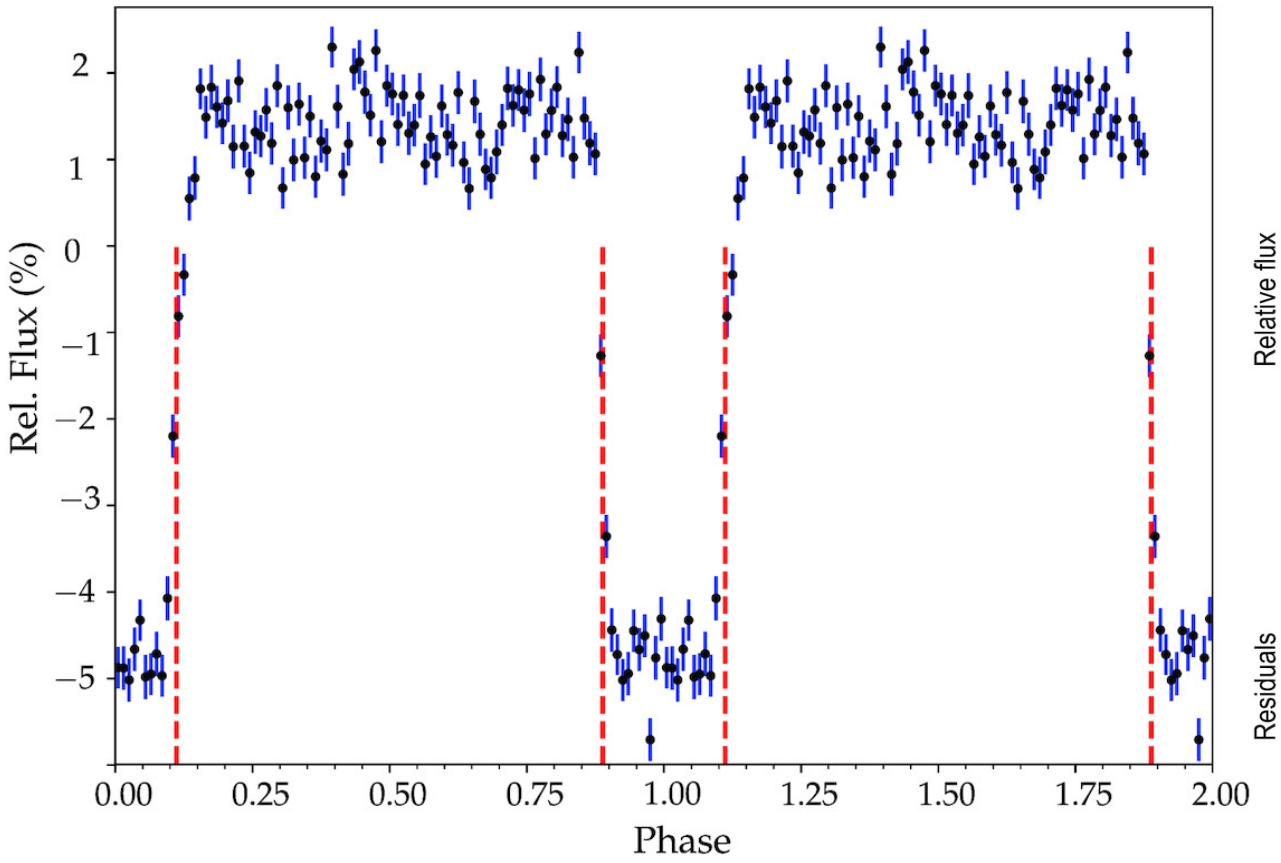
Black J
Red H
Blue K



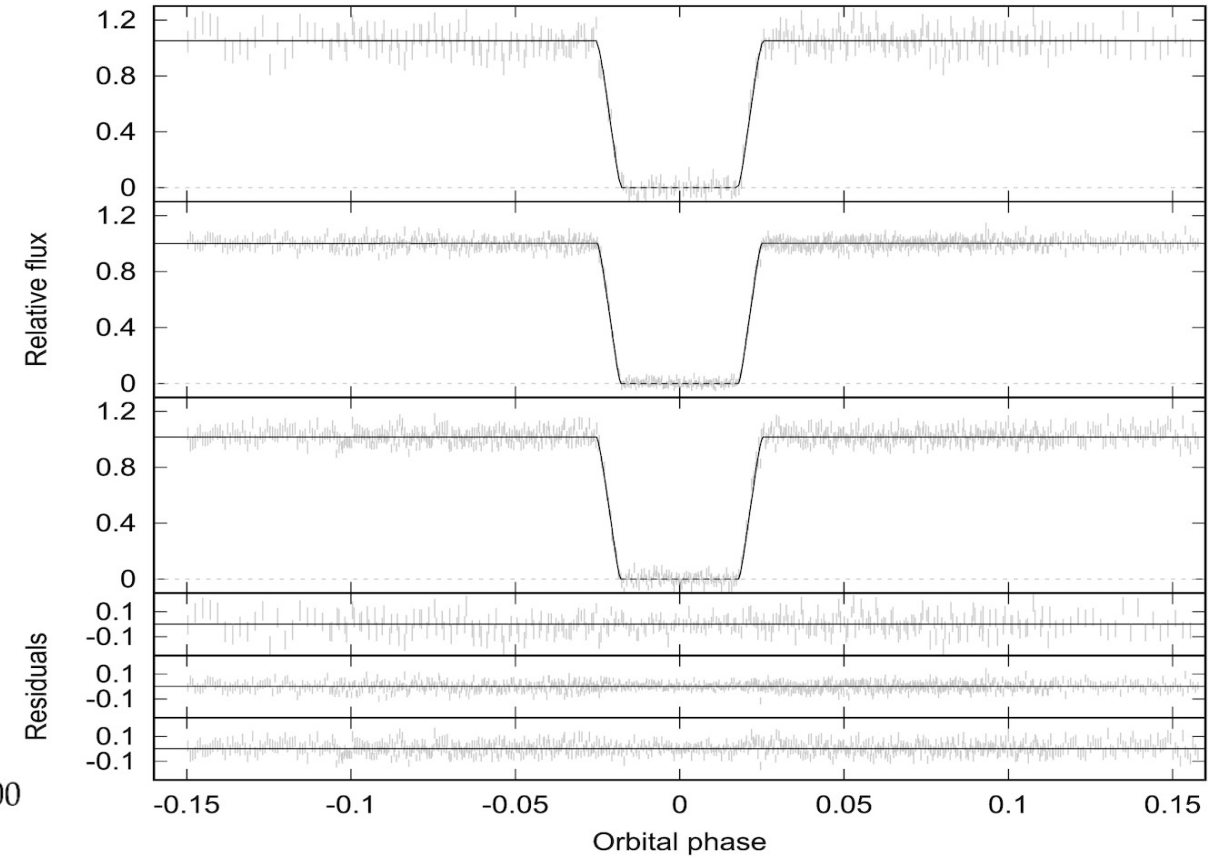
Black [3.6]
Blue [4.5]
Green [5.8]
Red [8.0]



K2 vs Ultracam



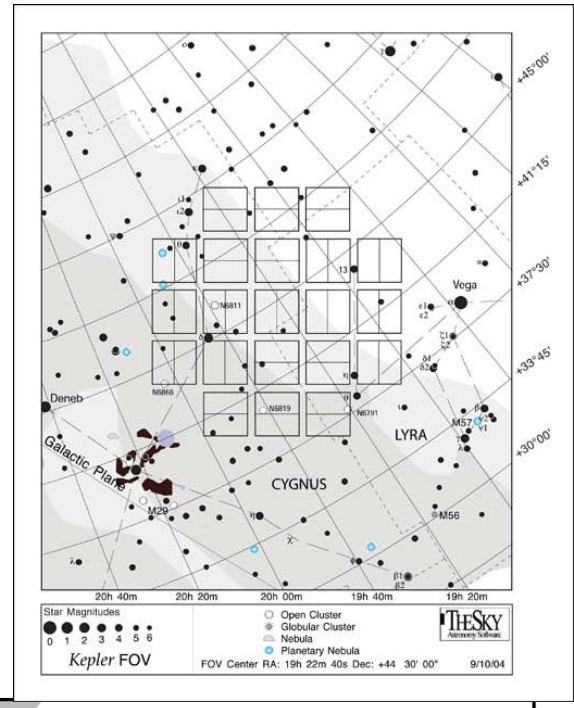
30 min cadence, "white light"



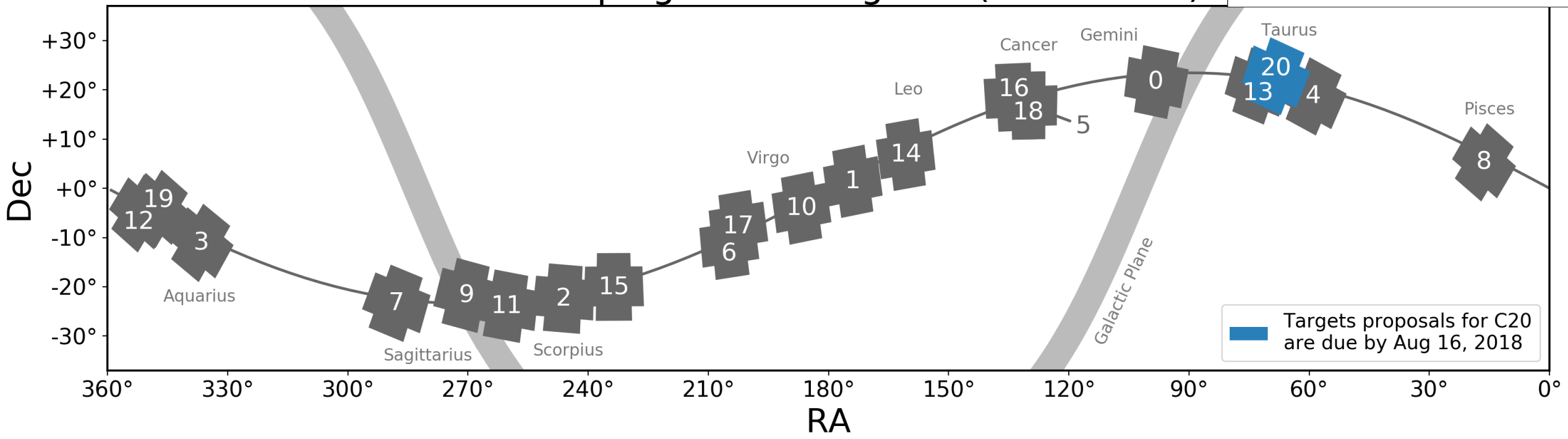
5 sec cadence, ugr

Kepler/K2

Observes in “white light”
Short (1 min) and long (30 min) cadence
115 sq deg FOV
Can observe relatively faint stars V~18 etc

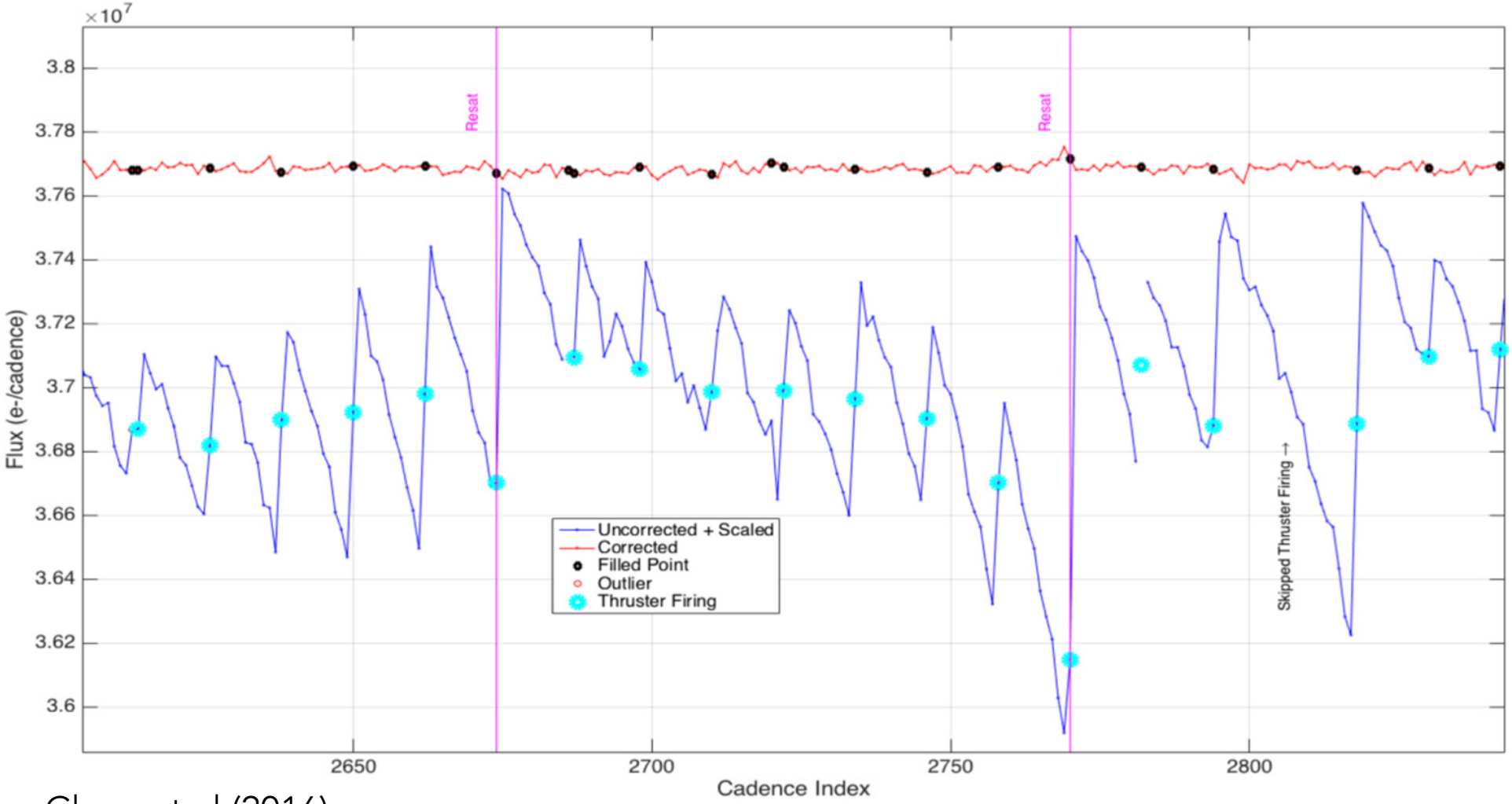


K2 Campaigns 0 through 20 (2014-2018)



Kepler/K2

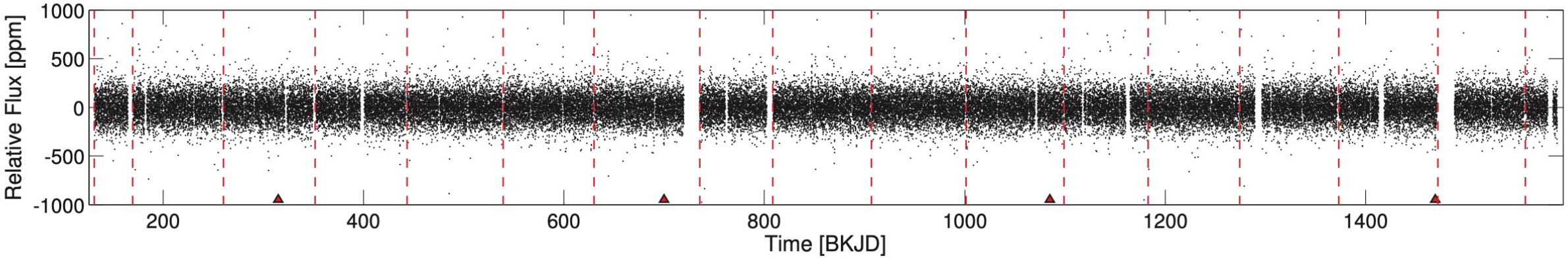
PDS pre-data conditioning or Simple Aperture Photometry (SAP)
Lots of artifacts, big pixel issues

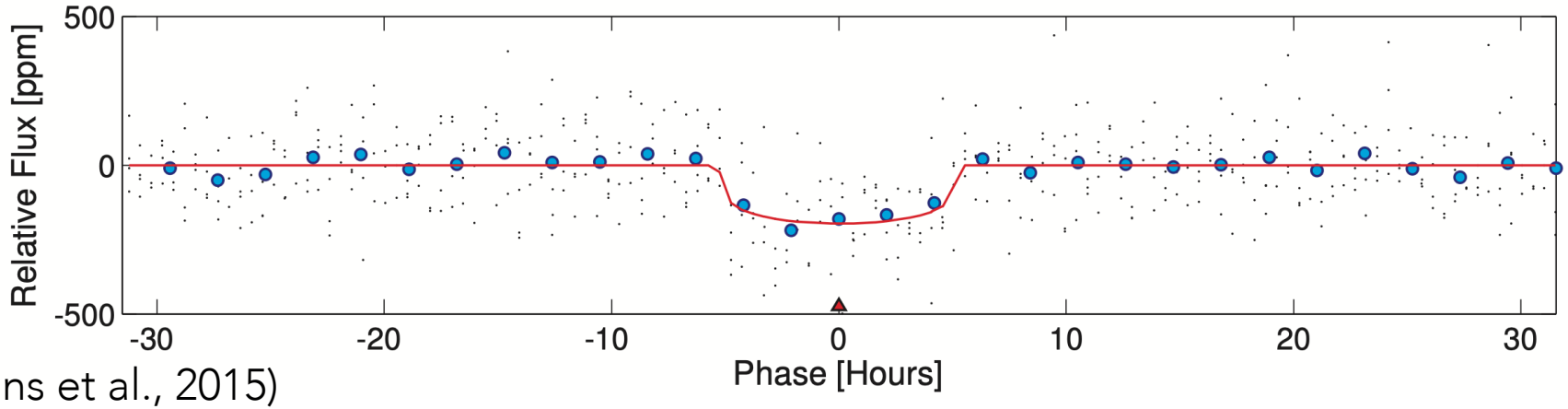


Van Cleve et al (2016)

Kepler/K2

Lots of custom pipelines available that take into account the pixels

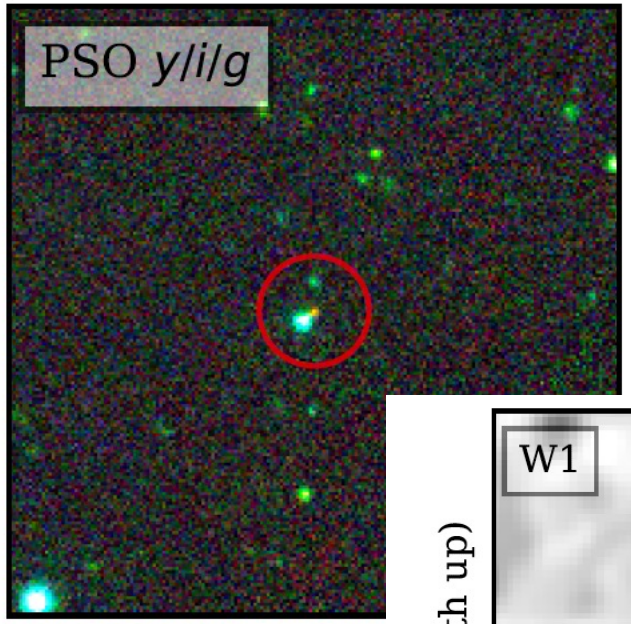


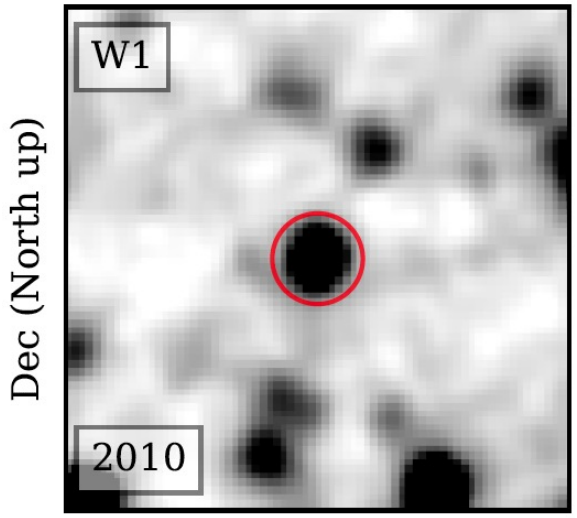


Kepler-452b (Jenkins et al., 2015)

Wide-field infrared survey explorer

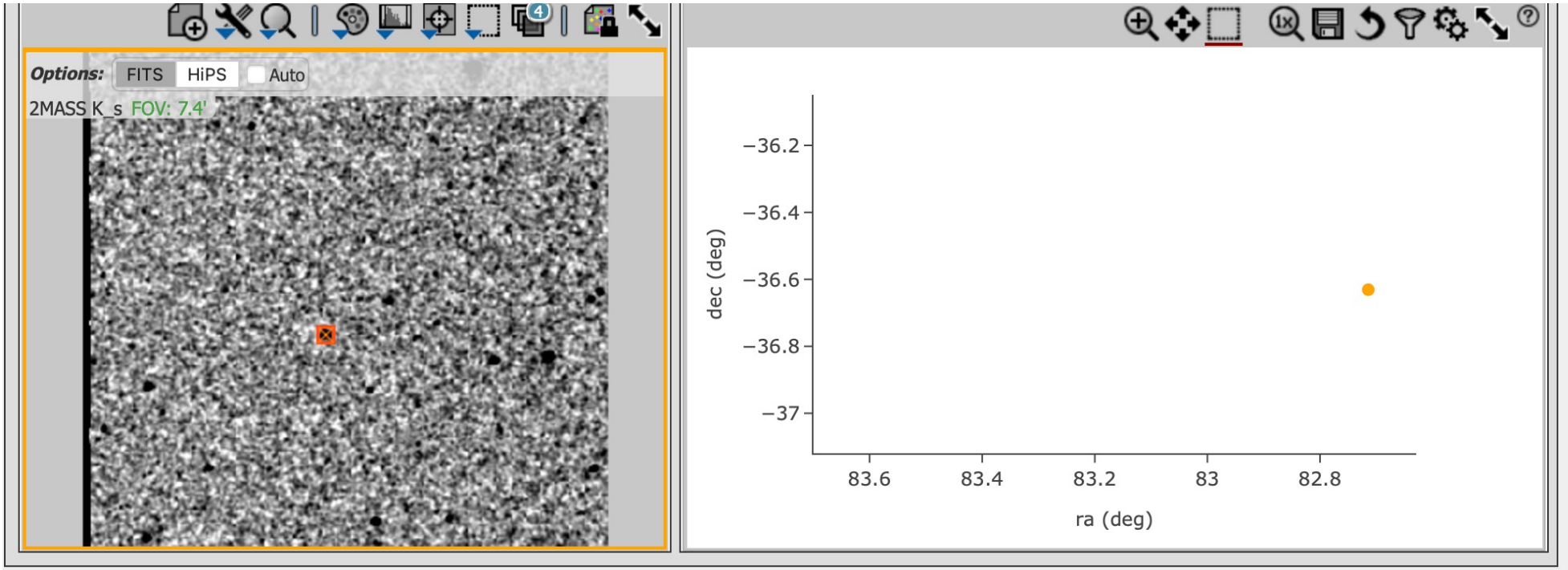
Observes in mid-IR
W1-4 (3.5, 4.5, 8, 22 microns)
Confusion can be large, blended





AllWISE Database Select				
Selection	Descriptions	# Columns	# Rows	Information
◉	AllWISE Source Catalog	334	747634026	
○	AllWISE Multiepoch Photometry Table	48	42759337365	
○	AllWISE Reject Table	334	428787253	
○	AllWISE Atlas Metadata Table	349	18240	
○	AllWISE Frame Cross-Reference Table	6	21208389	
○	AllWISE Atlas Inventory Table	7	18240	
○	AllWISE Atlas Image Inventory Table	76	72960	
○	AllWISE Refined Pointing Information for the Single-exposure Images	23	2786053	
NEOWISE Reactivation Database Select				
Selection	Descriptions	# Columns	# Rows	Information
○	NEOWISE-R Single Exposure (L1b) Source Table	167	151855284766	
○	NEOWISE-R Known Solar System Object Possible Association List (Caution)	54	148580080	
○	NEOWISE-R Single Exposure (L1b) Frame Metadata Table	255	20349725	
○	NEOWISE-R Single Exposure (L1b) Scan Inventory Table	7	88604	
○	NEOWISE-R Single Exposure (L1b) Image Inventory Table	90	40699355	
WISE All-Sky Database Select				
Selection	Descriptions	# Columns	# Rows	Information
○	WISE All-Sky Source Catalog	292	563921584	
○	WISE All-Sky Single Exposure (L1b) Source Table	233	9479433101	
○	WISE All-Sky Known Solar System Object Possible Association List (Caution)	68	7298315	
○	WISE All-Sky Reject Table	292	283887651	
○	WISE All-Sky Atlas Metadata Table	325	18240	
○	WISE All-Sky Frame Cross-Reference Table	6	14935779	
○	WISE All-Sky Single Exposure (L1b) Frame Metadata Table	417	1491686	
○	WISE All-Sky Single Exposure (L1b) Scan Inventory Table	7	6325	
○	WISE All-Sky Atlas Inventory Table	104	18240	

Wise: Multi epoch table

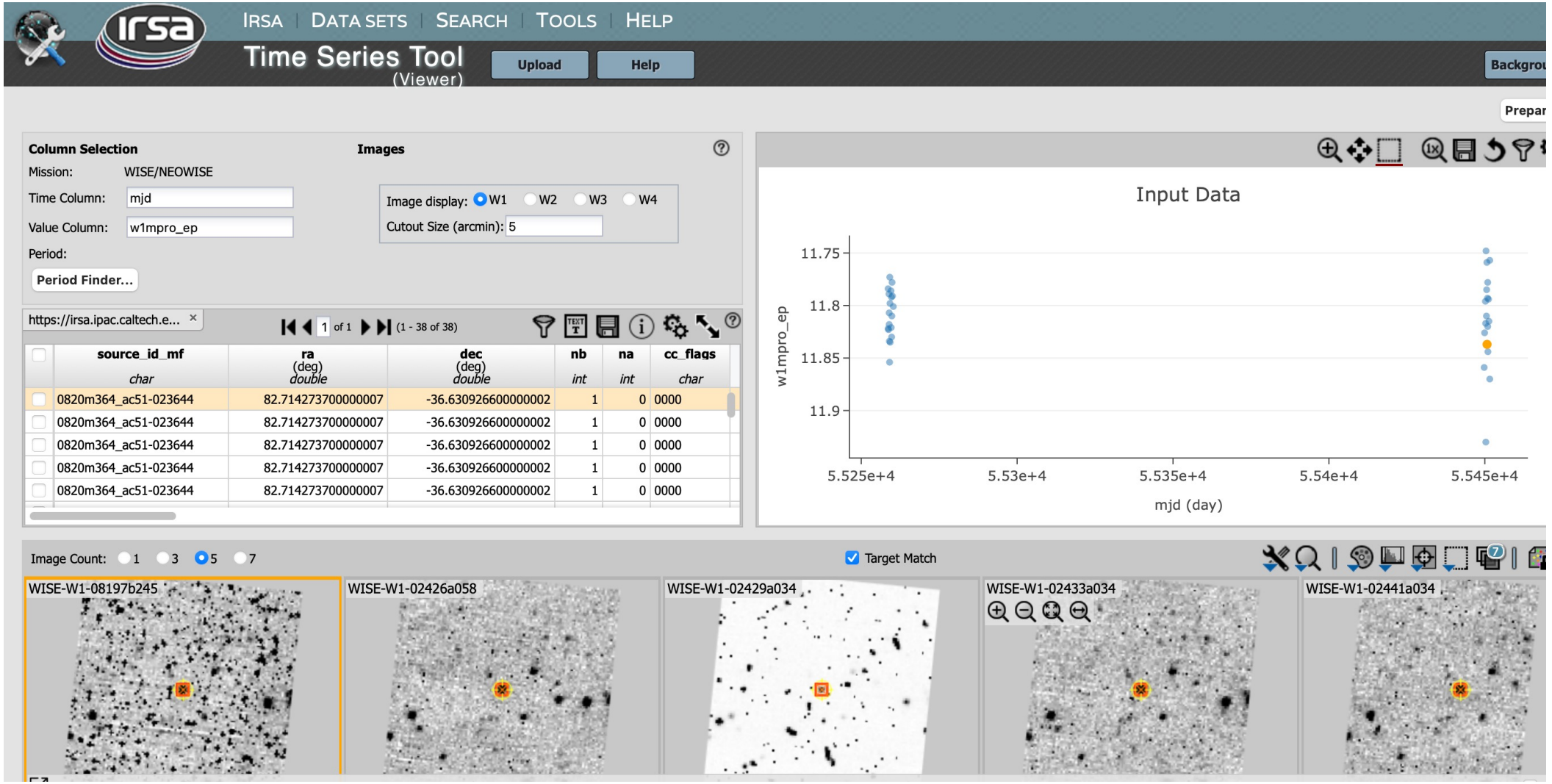


Full Result Table | Column Key | To Time Series Tool

1 of 1 (1 - 38 of 38)

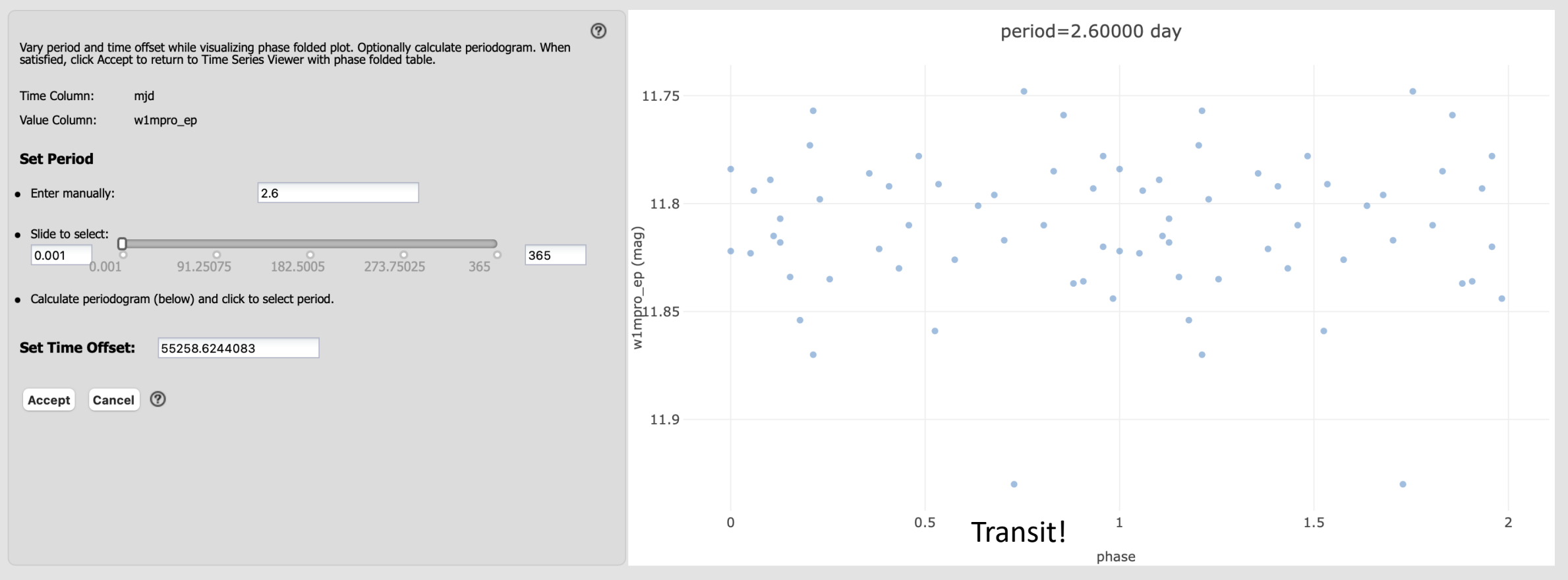
source_id_mf *char*	ra (deg) *double*	dec (deg) *double*	nb *int*	na *int*	cc_flags *char*	frame_id *char*	mjd (day) *double*	w1mpro_ep (mag) *double*	w1sigmpro_ep (mag) *double*	w1rchi2_ep *double*	w2mpr (mag) *doub*
0820m364_ac51-023644	82.7142737	-36.6309266	1	0	0000	08224a221	55451.57582350	11.870	0.033	1.492E+0	1
0820m364_ac51-023644	82.7142737	-36.6309266	1	0	0000	08224a220	55451.57569610	11.757	0.039	1.461E+0	1
0820m364_ac51-023644	82.7142737	-36.6309266	1	0	0000	02390a059	55258.62453570	11.822	0.029	1.286E+0	1
0820m364_ac51-023644	82.7142737	-36.6309266	1	0	0000	02394a058	55258.75683970	11.823	0.027	1.287E+0	1
0820m364_ac51-023644	82.7142737	-36.6309266	1	0	0000	02398a058	55258.88914380	11.789	0.025	1.303E+0	1

Wise: IRSA time series tool

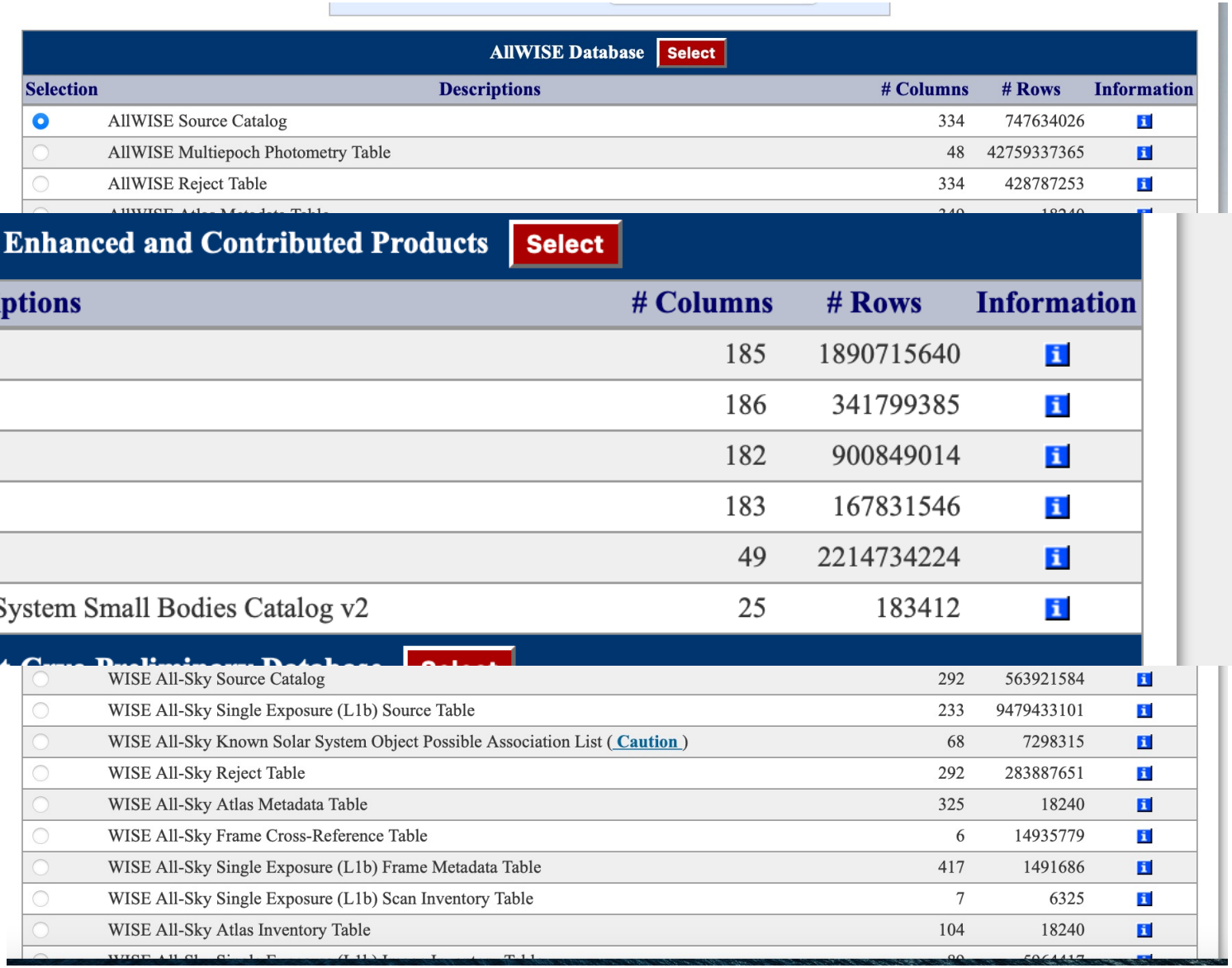


Wise

Light curve – poorly sampled
Useful to confirm variability or odd colours
Can play with the period/periodogram



Wise



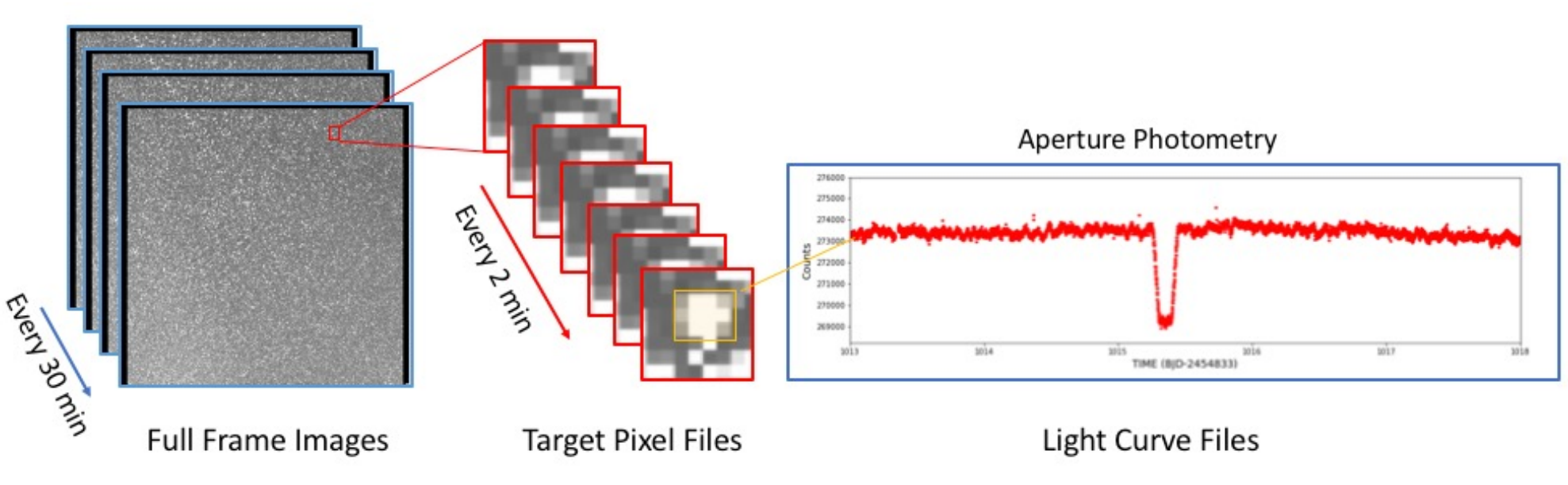
AllWISE Database	Select			
Selection	Descriptions	# Columns	# Rows	Information
◉	AllWISE Source Catalog	334	747634026	
○	AllWISE Multiepoch Photometry Table	48	42759337365	
○	AllWISE Reject Table	334	428787253	

WISE/NEOWISE Enhanced and Contributed Products	Select			
Selection	Descriptions	# Columns	# Rows	Information
○	CatWISE2020 Catalog	185	1890715640	
○	CatWISE2020 Reject Table	186	341799385	
○	CatWISE Preliminary Catalog	182	900849014	
○	CatWISE Preliminary Reject Table	183	167831546	
○	unWISE Catalog	49	2214734224	
○	NEOWISE Derived Diameters and Albedos of Solar System Small Bodies Catalog v2	25	183412	

WISE Post-Cryo Preliminary Database	Select		
○	WISE All-Sky Source Catalog	292	563921584
○	WISE All-Sky Single Exposure (L1b) Source Table	233	9479433101
○	WISE All-Sky Known Solar System Object Possible Association List (Caution)	68	7298315
○	WISE All-Sky Reject Table	292	283887651
○	WISE All-Sky Atlas Metadata Table	325	18240
○	WISE All-Sky Frame Cross-Reference Table	6	14935779
○	WISE All-Sky Single Exposure (L1b) Frame Metadata Table	417	1491686
○	WISE All-Sky Single Exposure (L1b) Scan Inventory Table	7	6325
○	WISE All-Sky Atlas Inventory Table	104	18240

Transiting Exoplanet Survey Satellite

Observes in the I(ish) band (Tmag)
Each sector observed for ~30 days but,
some areas are in overlapping sectors or continual viewing zone
Call for proposals ~once a year: submit targets to the input catalogue (TIC)
Long cadence (30 min) and short candence (2 min/20 s)
Handy website for checking targets: https://eta-earth.org/tess_play.html
MAST access



Transiting Exoplanet Survey Satellite

2 types of lightcurves - FFI go to quick look,
2 min/20s go to SPOC pipeline

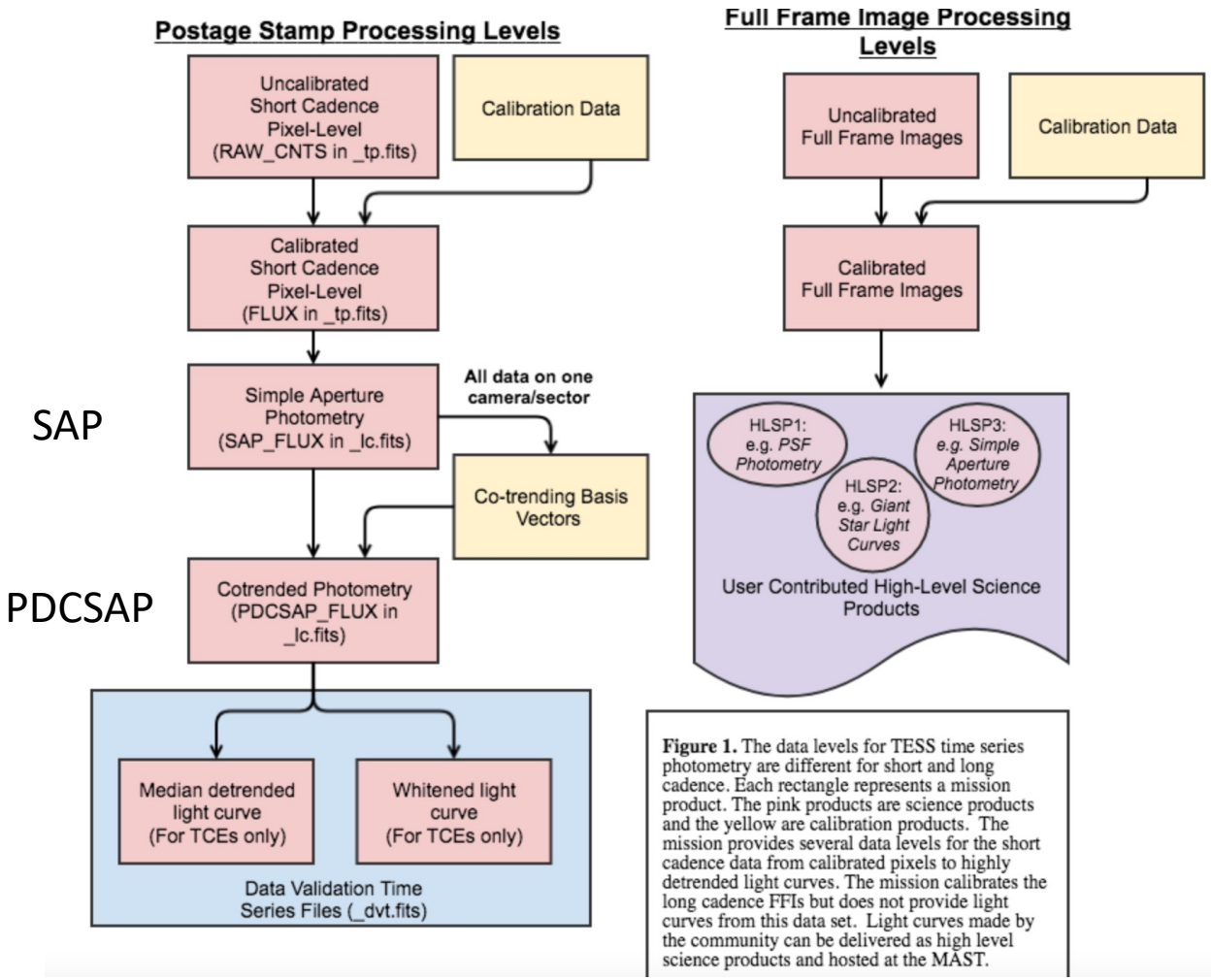
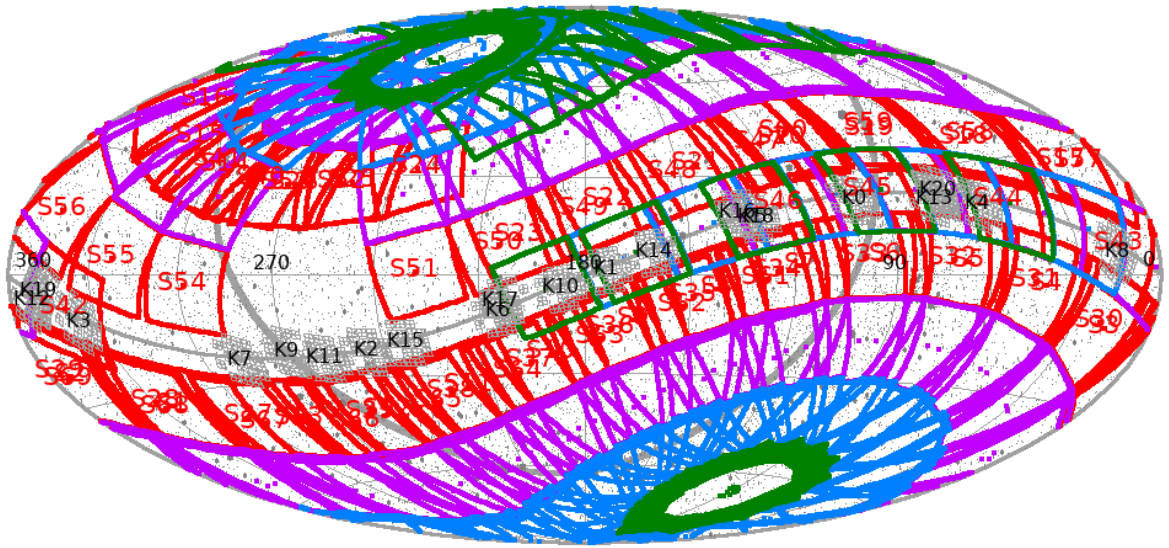
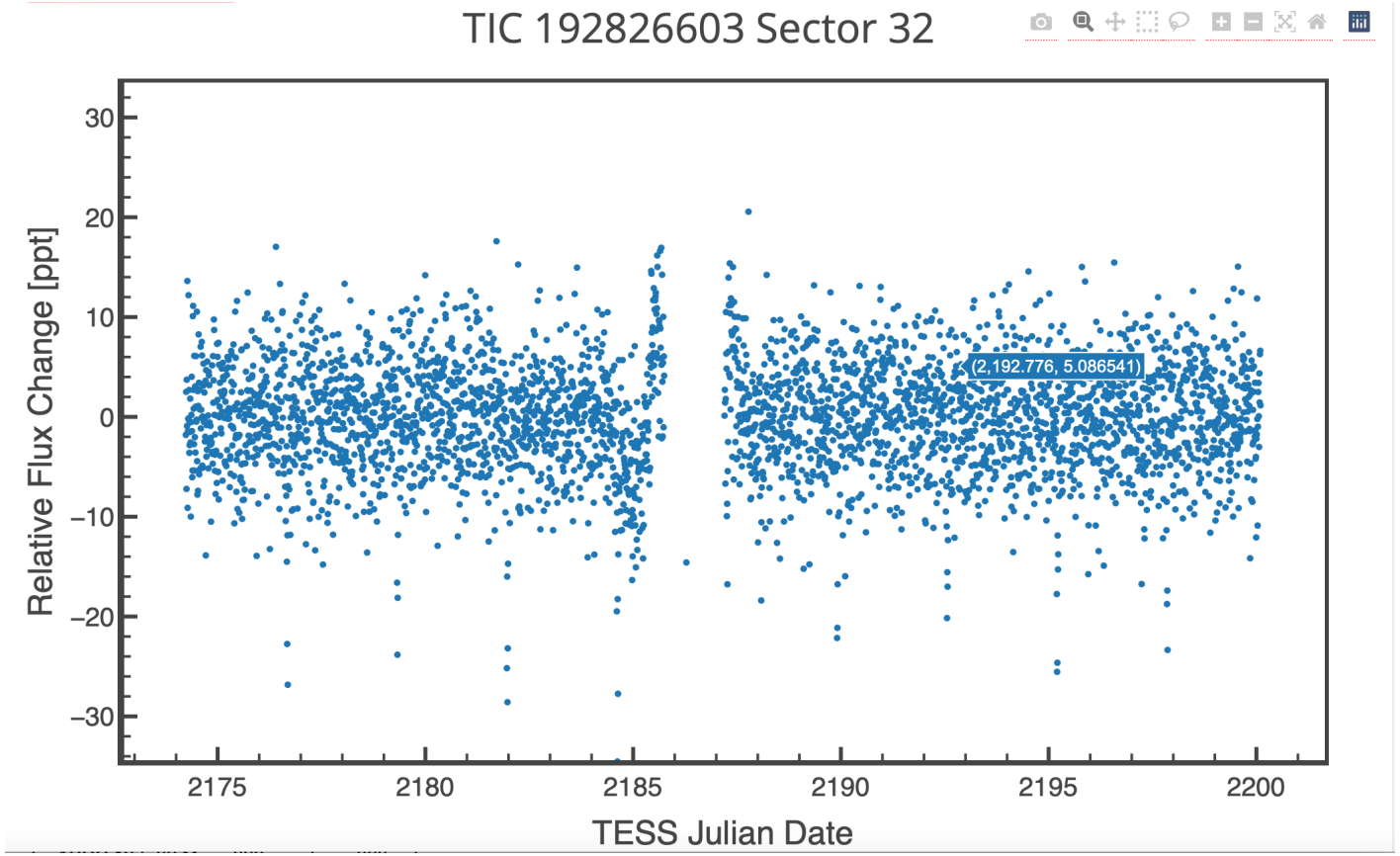


Figure 1. The data levels for TESS time series photometry are different for short and long cadence. Each rectangle represents a mission product. The pink products are science products and the yellow are calibration products. The mission provides several data levels for the short cadence data from calibrated pixels to highly detrended light curves. The mission calibrates the long cadence FFIs but does not provide light curves from this data set. Light curves made by the community can be delivered as high level science products and hosted at the MAST.



TESS:

Handy website for checking targets:
https://eta-earth.org/tess_play.html
TIC ID, fits file of SPOC lightcurve, curl script
Plots binned to 10 mins



TESS Observability

Sector	Camera	CCD	Column [pix]	Row [pix]	Edge Warn
5	3	1	1074.622	1131.447	0
6	3	2	1247.730	1161.983	0
32	3	1	1536.913	1062.675	0
33	3	2	1826.848	1316.373	0

MAST Light Curve Holdings

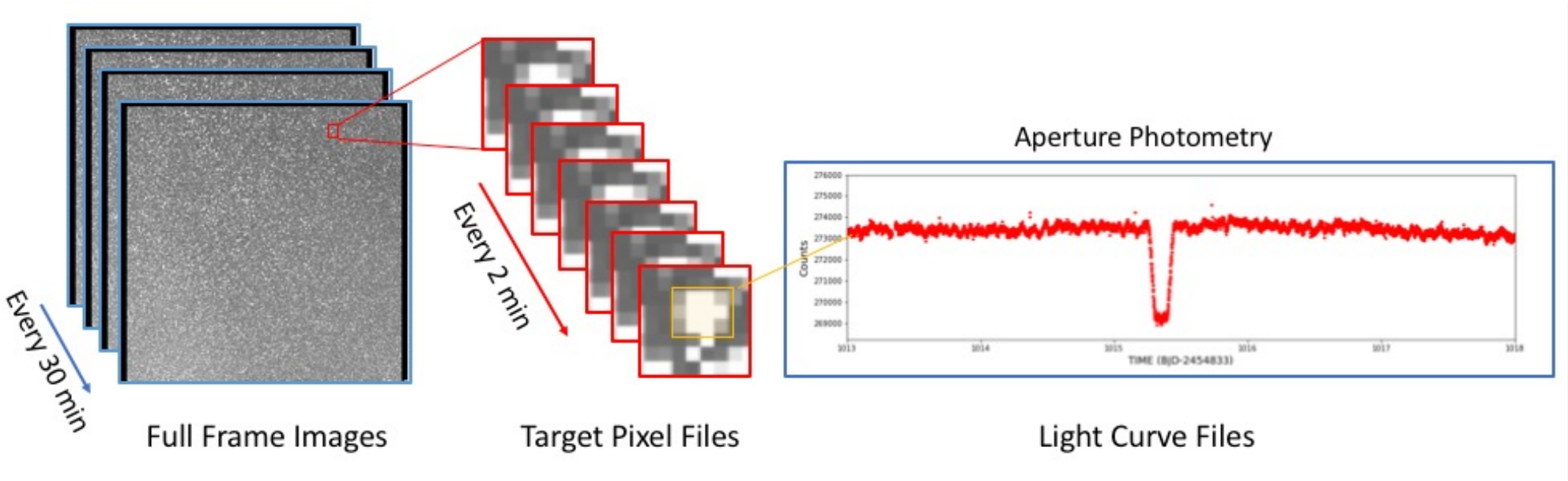
Download curl script for all light curves

TIC ID	Sector Number	Exposure Time [s]	Download	Light Curve Preview
192826603	5	120	link	link
192826603	6	120	link	link
192826603	32	20	link	link
192826603	32	120	link	link
192826603	33	20	link	link
192826603	33	120	link	link

19 (~32 Myr, ~390 members, 360 pc)

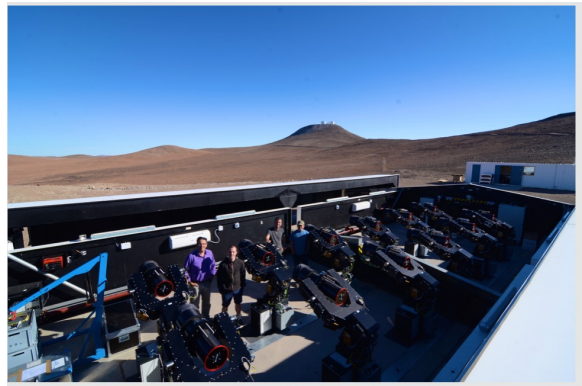
Transiting Exoplanet Survey Satellite

Issues!
2 types of lightcurve – use the best for your science
Big pixels – crowded fields may be blended
Noisy for faint (I>15) objects
Multiple extraction tools available
Data gap for download/spacecraft housekeeping



Next Generation Transit Survey

Similar passband to TESS ~I band
Southern hemisphere
All stars in a field down to I~15.5
13s cadence
Typical field observed for 60 days, but many for longer



European Southern Observatory

ESO — Reaching New Heights in Astronomy

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Science Users Information > Science Archive Facility > News and Updates > Second data release of the Next Generation Transit Survey 20 Sep 2022

Science Archive Facility

- Data Portal
- ESO Data
- Hubble Space Telescope Data
- Virtual Observatory Tools
- Catalogues, Plates and DSS
- Tools and Documentation
- Related External Services
- ESO & HST Image Galleries
- **News and Updates**
- FAQ
- ESO Data Access Policy

Second data release of the Next Generation Transit Survey

Published: 20 Jul 2020

The Next Generation Transit Survey (NGTS) is a ground based exoplanet survey designed to detect Neptune and super-Earth sized planets orbiting around bright stars, using the transit method. The NGTS facility consists of 12 fully-robotic 20 cm f/2.8 telescopes located at the ESO site on Paranal, Chile. Each telescope has a 2.8x2.8 deg^2 field of view and is equipped with a custom filter with a bandpass of 520-890nm, which increases sensitivity to late-K and early-M stars.

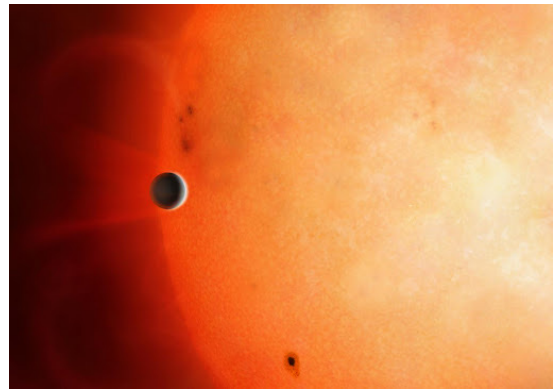
This second data release (DR2) includes 72 separate fields that have been completed from the start of commissioning in September 2015, till April 2018. The data of the 24 fields already provided within DR1 have been reprocessed with an improved version of the reduction pipeline. A source catalogue down to 16th magnitude is provided, together with the light curves obtained with aperture photometry in addition to the reduced, astrometrically calibrated, stacked dithered images. More than six hundred thousand sources were monitored with a 13 second cadence, collecting almost 110 billion photometric measurements in total. The overall data volume is about 4 Terabytes.

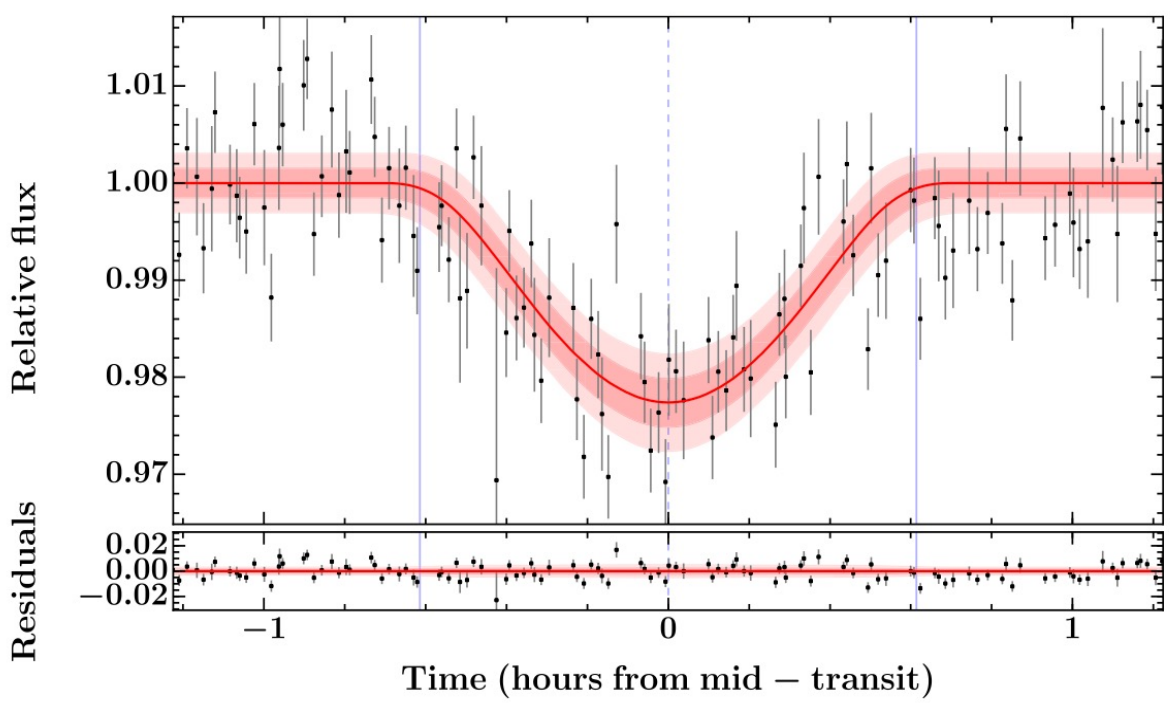
All data are publicly accessible from the Science Portal or programmatically in a file-by-file fashion. Per-source data access is provided by the Catalogue Facility or via TAP. Detailed information is available in the accompanying release documentation.

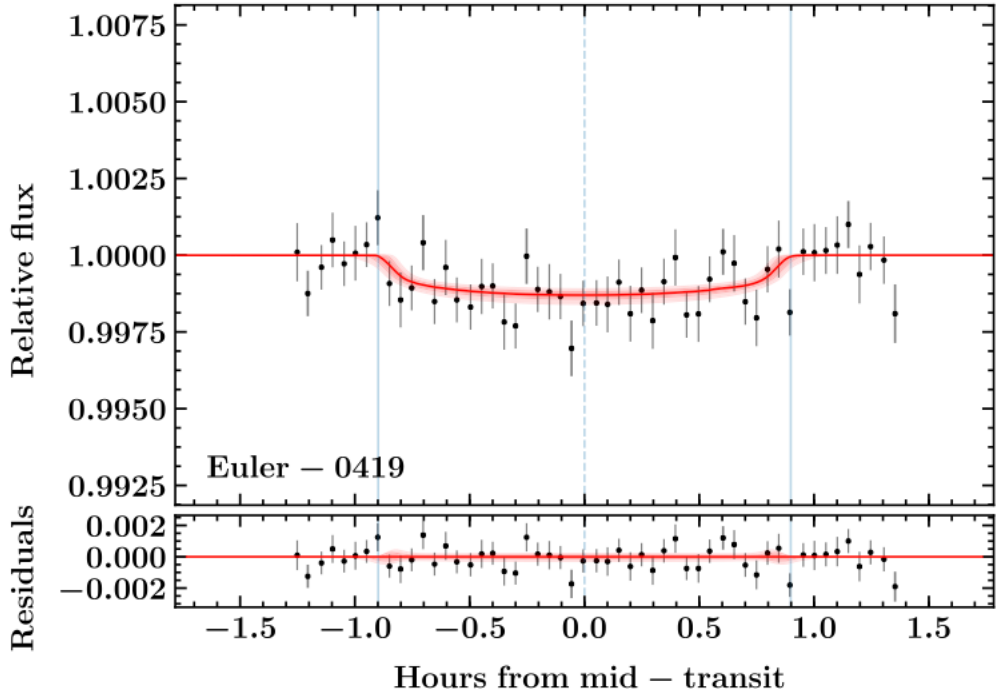
Next Generation Transit Survey

NGTS-1b
M dwarf star
Half mass and size of sun
Orbit is 2.3 days
0.8 Jupiter masses
1.33 Jupiter radii

NGTS-4b
K dwarf star
3/4 size of sun
Orbit is 1.33 days
0.06 Jupiter masses
20 Earth masses







Images: Mark Garlick

Next Generation Transit Survey:Caveats

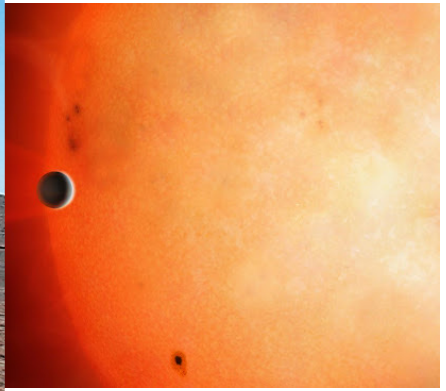
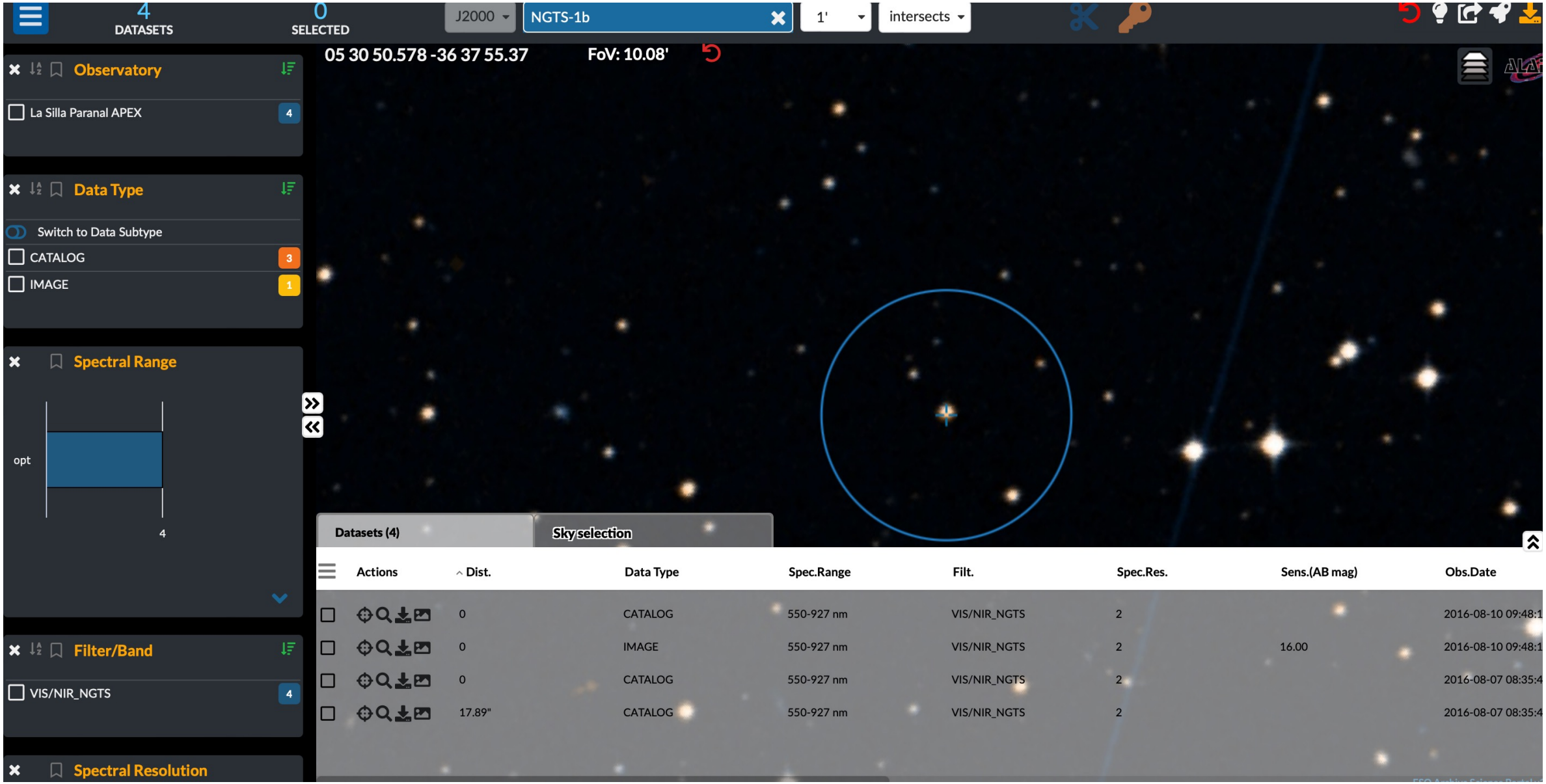


Image: Mark Garlick

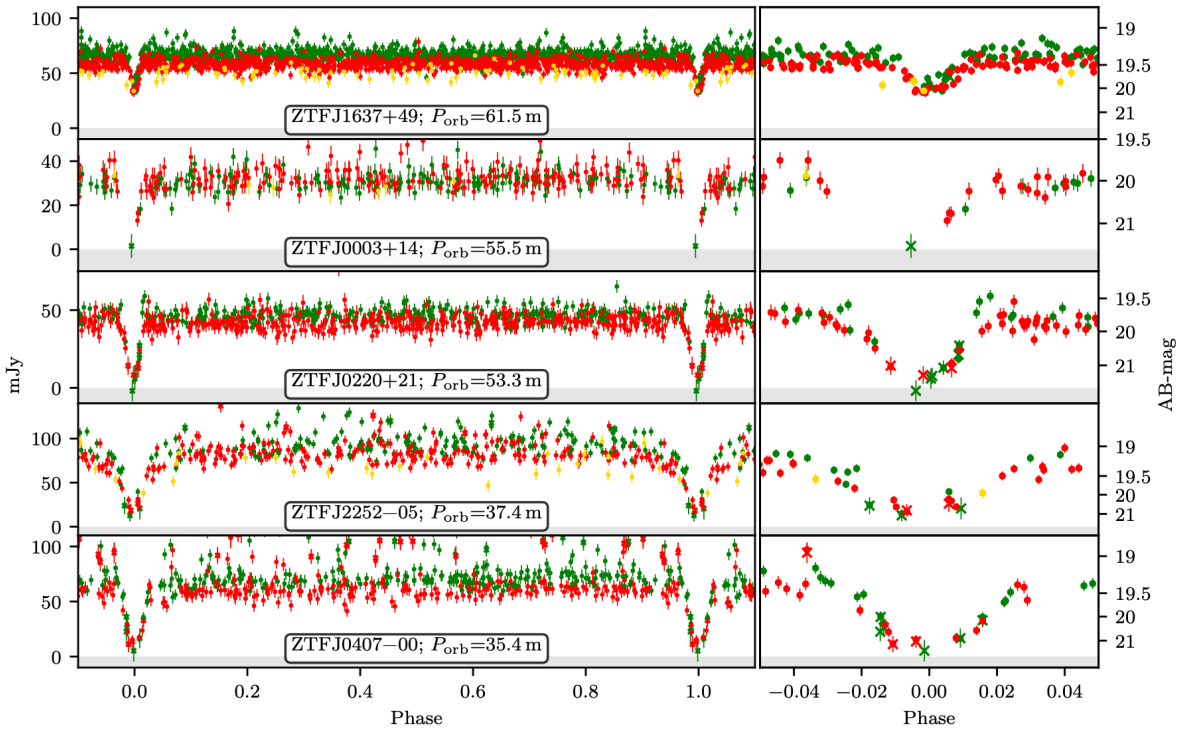
Ground based – so 8-14 hrs observing a night
Weather dependent
Big pixels (but smaller than TESS
Affected by the moon
Affected by VLT laser!!!!

NGTS


4
DATASETS
0
SELECTED
J2000
NGTS-1b
1'
intersects
05 30 50.578 -36 37 55.37
FoV: 10.08'
Observatory
La Silla Paranal APEX 4
Data Type
Switch to Data Subtype
CATALOG 3
IMAGE 1
Spectral Range
opt
4
Filter/Band
VIS/NIR_NGTS 4
Spectral Resolution
Datasets (4)
Sky selection
Actions
Dist.
Data Type
Spec.Range
Filt.
Spec.Res.
Sens.(AB mag)
Obs.Date
0 CATALOG 550-927 nm VIS/NIR_NGTS 2 2016-08-10 09:48:1
0 IMAGE 550-927 nm VIS/NIR_NGTS 2 16.00 2016-08-10 09:48:1
0 CATALOG 550-927 nm VIS/NIR_NGTS 2 2016-08-07 08:35:4
17.89" CATALOG 550-927 nm VIS/NIR_NGTS 2 2016-08-07 08:35:4

Zwicky Transient Facility

Located at Palomar so Northern
Low cadence: Whole sky every 2 days
g,r,i
Access via IRSA



van Roestel et al., 2022

Zwicky Transient Facility: Alert brokers

ZTF Alert Archive

tar file of all 5 sigma events
Need to filter for your science
Some brokers (Lasair) get live access
Jupyter notebooks available

Community Alert Brokers

The alert stream archive provides only nightly summaries of the ZTF alerts. There is currently a suite of public event brokers that provide real time access to the ZTF alert stream.

ALeRCE	Lasair	MARS	Fink
ANTARES	AMPEL	Pitt/Google	
SASSy	POI/Variables		

Create your own watchlist
List of known objects or “things that do X”
Will email when an object does something

Vera C. Rubin Telescope (LSST)

8.4m mirror near La Serena
Surveys whole sky in 3 nights
6 colours, ugrizy
Alert brokers being tested on ZTF
Plans for drop outs as well as brightening events

Science Collaborations – join them!

Galaxies
Stars, Milky Way and Local Volume
Solar System
Dark Energy
Active Galactic Nuclei
Transients/Variable stars
Strong Lensing
Informatics and Statistics
https://www.lsstcorporation.org/science-collaborations

Vera C. Rubin Telescope (LSST)

What will Rubin Observatory data look like?

Rubin Observatory will deliver calibrated images and data products on a daily and annual basis, and will provide the science community with the Rubin Science Platform to enable data access and analysis.

Read more or view a short recorded presentation about the planned data products, their processing pipelines, and the resources for the science community.

Prompt data products (for transients, variables, and moving objects):

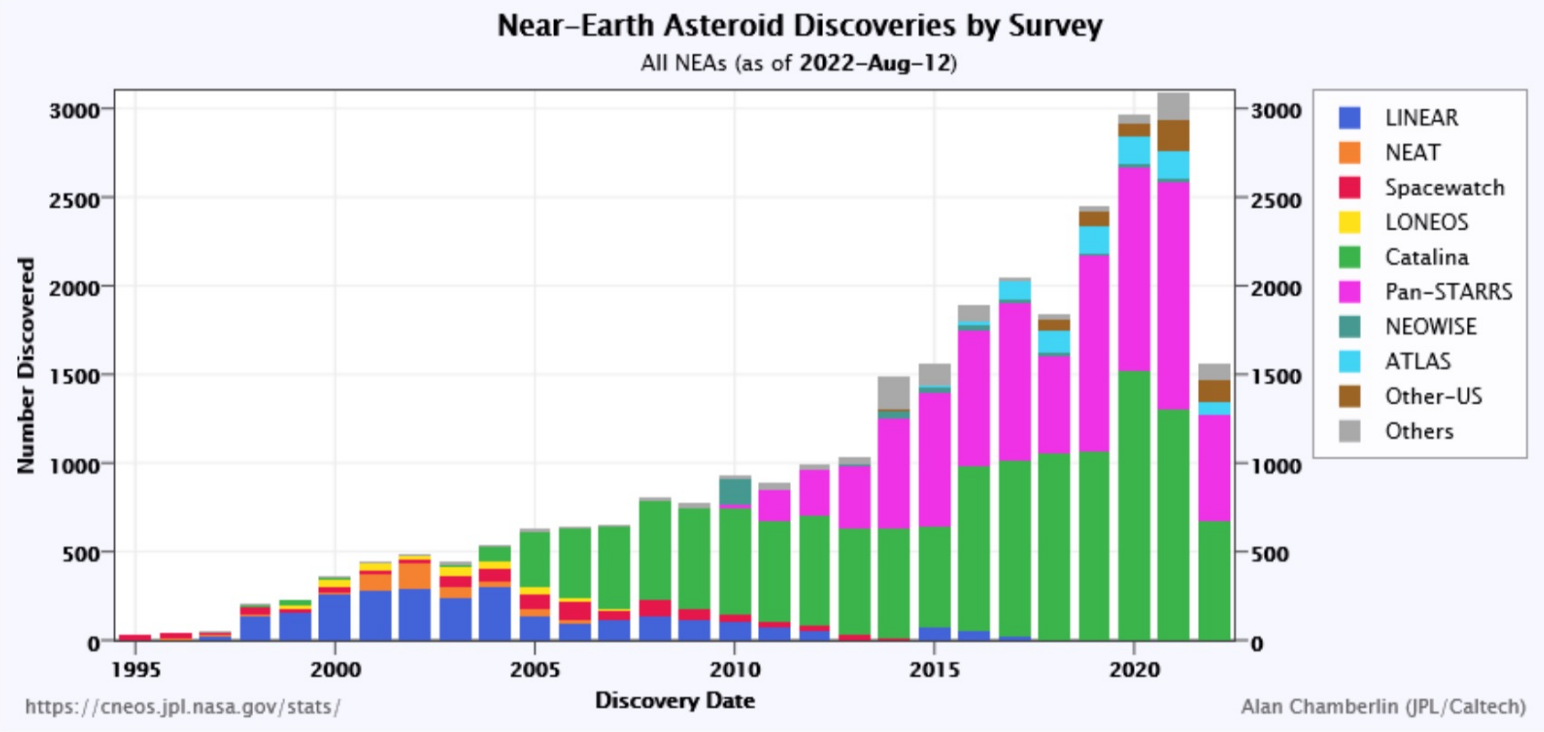
- Alert packets for sources detected in difference images (difference = direct-template), delivered to brokers (60 seconds).
- Catalogs of sources (associated by location into "objects") detected in difference images (24 hours).
- Catalogs of moving objects with orbital parameters from the MPC (a result of daytime processing).
- Direct and difference images (24 hours).

Data Releases data products (for static sky sources like stars and galaxies):

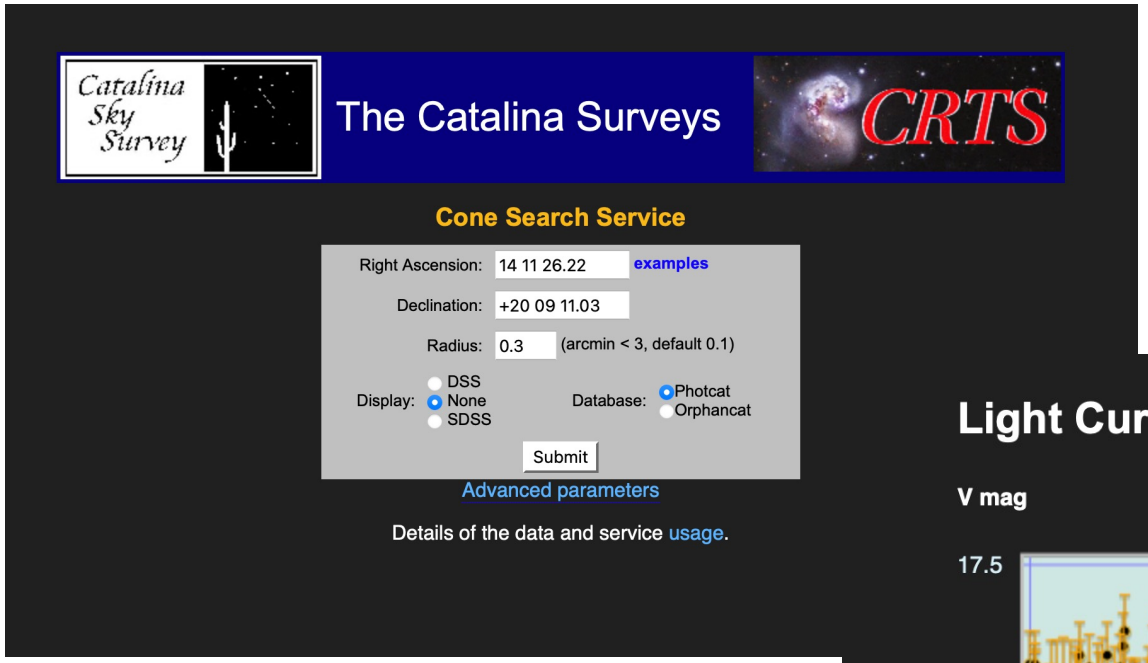
- A global and uniform processing of all the data taken from the start of the survey until a given date (typically 6 months before the release).
- Raw and calibrated images, the calibration data, and deeply stacked coadded images.
- Source and object catalogs with measurements (centroids, fluxes, magnitudes, shape and size parameters, and more).
- Includes re-processed Prompt data products and direct image light curves.

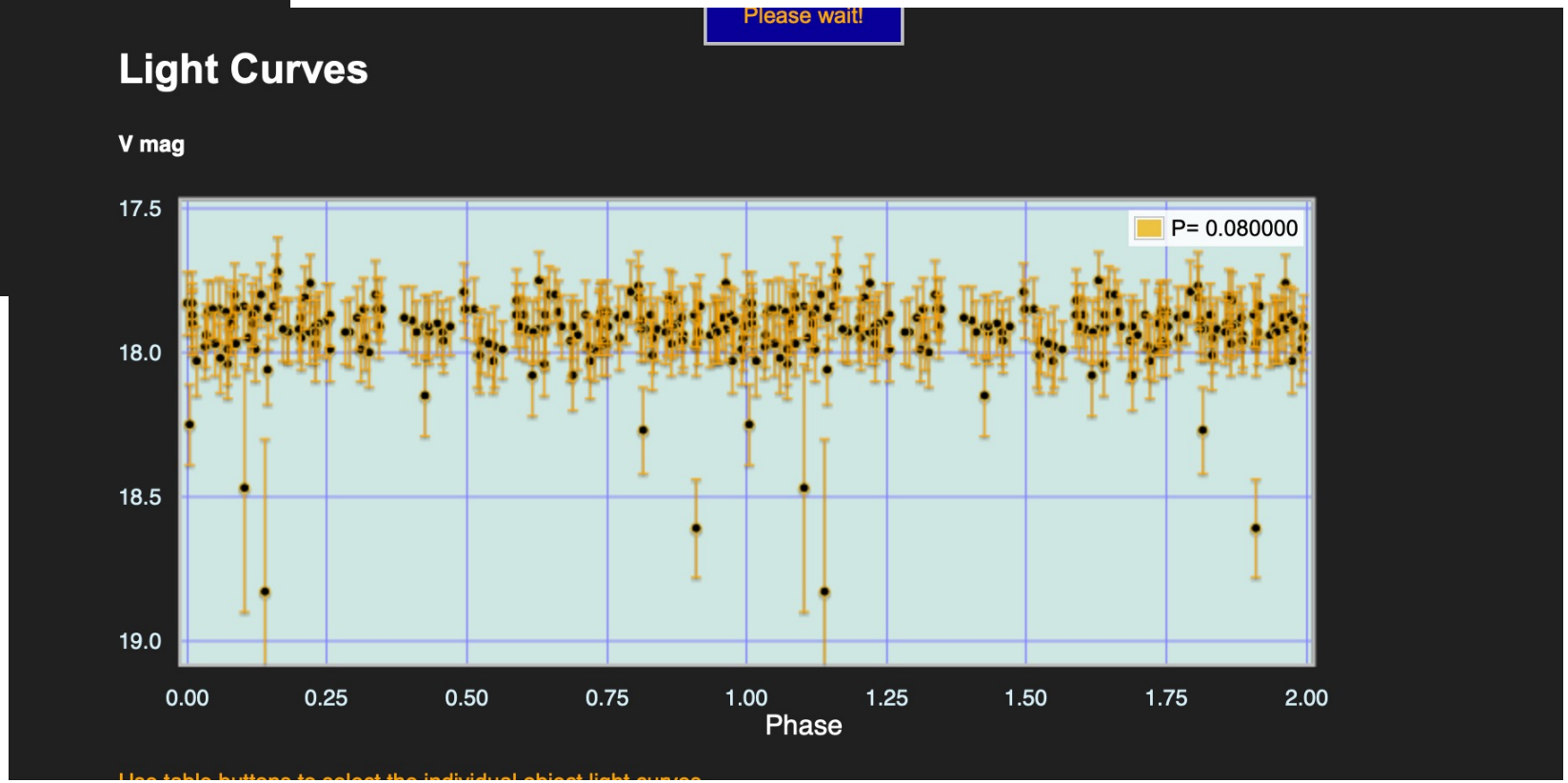
Catalina Sky Survey

24 days observing (not during full moon)
Searching for Near Earth Object Candidates
Data released through Caltech
Interface is a bit clunky
Search on object name etc



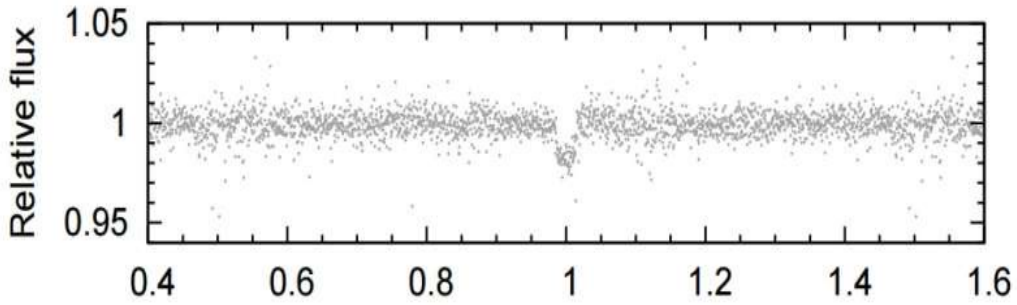
Catalina Sky Survey



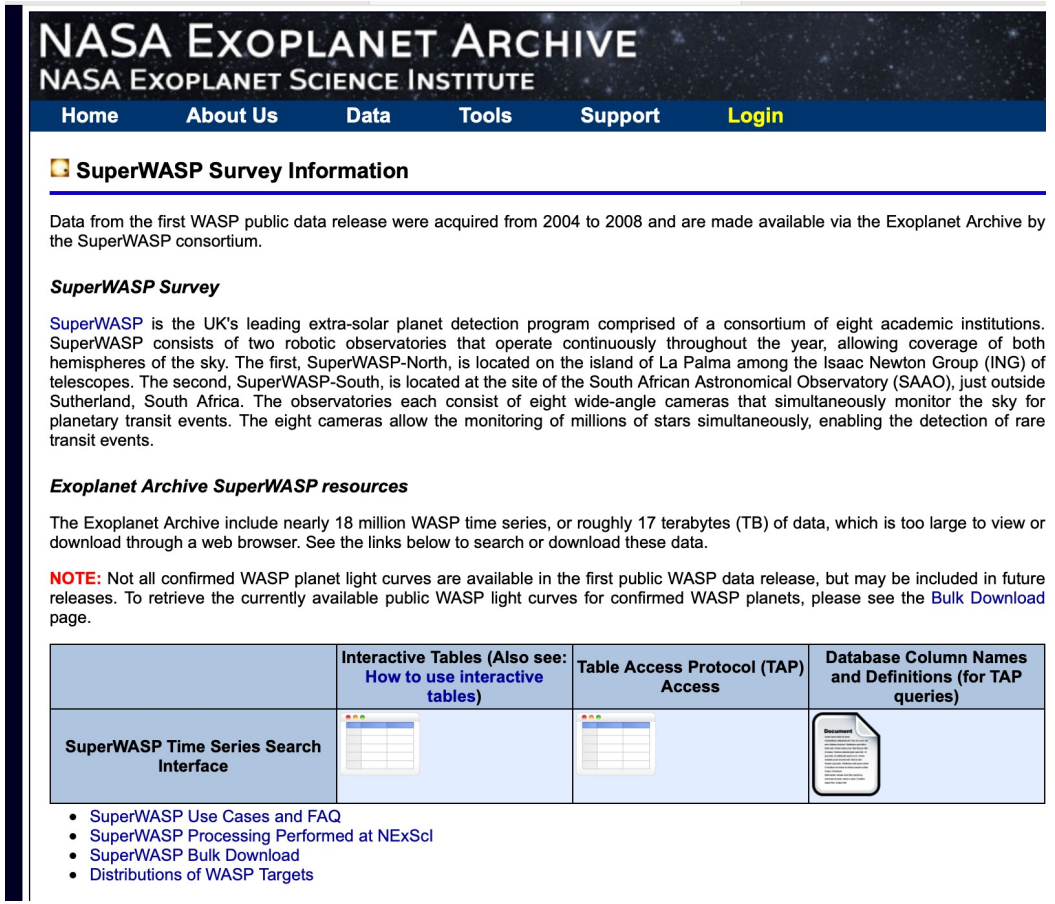


SuperWASP

Northern and Southern
Bright objects only
Cadence can be very scattered
Over 100 planets discovered
Binaries catalogued in TEPCat
https://www.astro.keele.ac.uk/~jkt/tepcat/
Data at NASA Exoplanet archive



Wasp-91b: Anderson et al., 2017



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SuperWASP Survey Information

Data from the first WASP public data release were acquired from 2004 to 2008 and are made available via the Exoplanet Archive by the SuperWASP consortium.

SuperWASP Survey

SuperWASP is the UK's leading extra-solar planet detection program comprised of a consortium of eight academic institutions. SuperWASP consists of two robotic observatories that operate continuously throughout the year, allowing coverage of both hemispheres of the sky. The first, SuperWASP-North, is located on the island of La Palma among the Isaac Newton Group (ING) of telescopes. The second, SuperWASP-South, is located at the site of the South African Astronomical Observatory (SAAO), just outside Sutherland, South Africa. The observatories each consist of eight wide-angle cameras that simultaneously monitor the sky for planetary transit events. The eight cameras allow the monitoring of millions of stars simultaneously, enabling the detection of rare transit events.

Exoplanet Archive SuperWASP resources

The Exoplanet Archive include nearly 18 million WASP time series, or roughly 17 terabytes (TB) of data, which is too large to view or download through a web browser. See the links below to search or download these data.

NOTE: Not all confirmed WASP planet light curves are available in the first public WASP data release, but may be included in future releases. To retrieve the currently available public WASP light curves for confirmed WASP planets, please see the Bulk Download page.

	Interactive Tables (Also see: How to use interactive tables)	Table Access Protocol (TAP) Access	Database Column Names and Definitions (for TAP queries)
SuperWASP Time Series Search Interface			

- SuperWASP Use Cases and FAQ
- SuperWASP Processing Performed at NExScI
- SuperWASP Bulk Download
- Distributions of WASP Targets

Advice:

- Search all catalogues possible
- Don’t forget high energy or radio
- Low cadence data may help confirm conclusions even if its not “science quality”
- Instruments capable of fast cadence (Ultracam, Hipercam, Hawk-I are available)
- Getting an SED using SVO (see workshop later in the week) is useful
- Some knowledge of SQL can be really useful!

Useful links:

Galex:https://archive.stsci.edu/missions-and-data/galex
XMM Serendipitous Source Cat:https://xmmssc.aip.de/cms/catalogues/4xmm-dr12s/
SDSS: https://dr17.sdss.org
Superwasp: https://exoplanetarchive.ipac.caltech.edu/docs/SuperWASPMission.html
Panstarrs: https://catalogs.mast.stsci.edu/panstarrs/
CSS: http://nesssi.cacr.caltech.edu/DataRelease/
2MASS: https://irsa.ipac.caltech.edu/Missions/2mass.html
UKIDSS: http://wsa.roe.ac.uk/index.html
VISTA: http://horus.roe.ac.uk/vsa/index.html
WISE: https://irsa.ipac.caltech.edu/Missions/wise.html
IRSA finder: https://irsa.ipac.caltech.edu/applications/finderchart/
Filter profiles: http://svo2.cab.inta-csic.es/theory/fps/index.php?id=GAIA/GAIA2.G
Unit conversion: https://www.stsci.edu/~strolger/docs/UNITS.txt