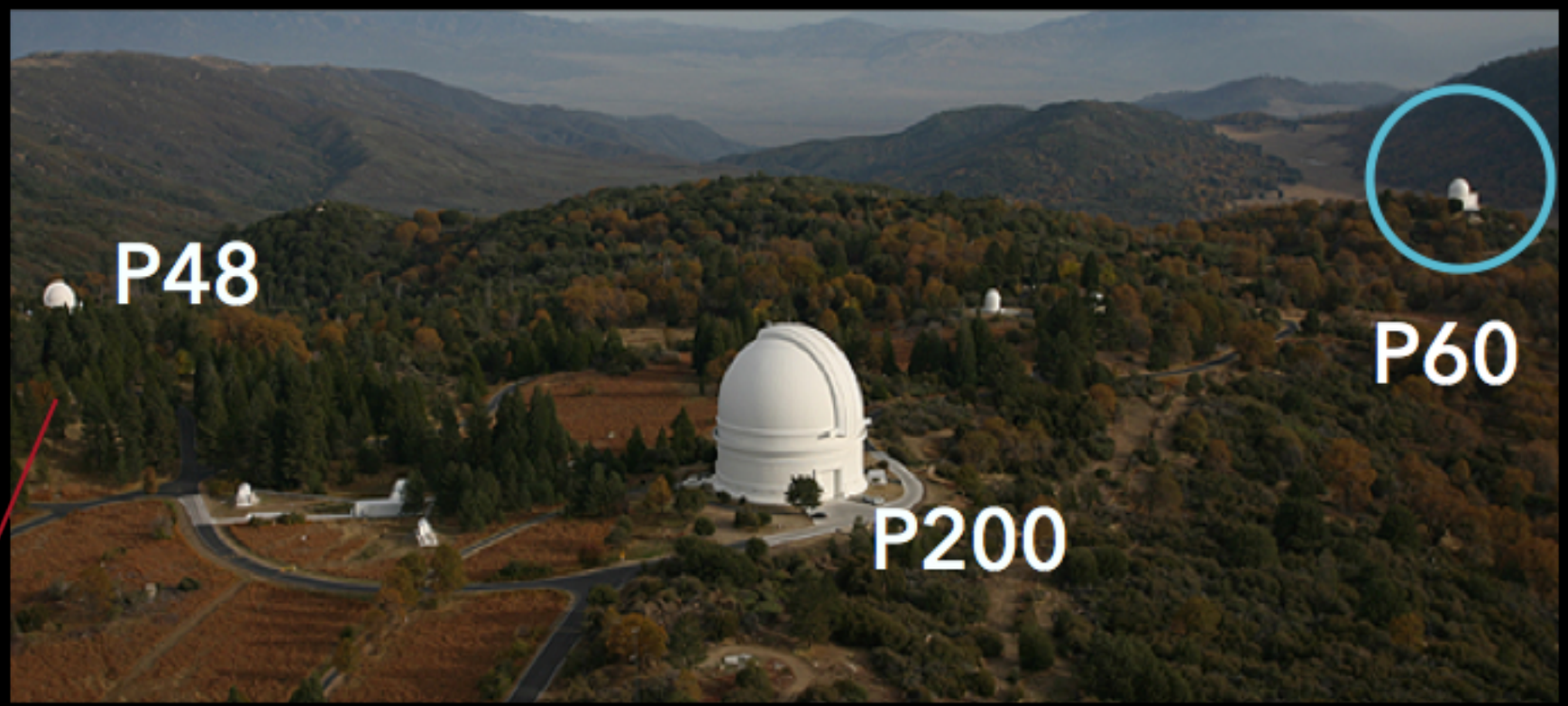
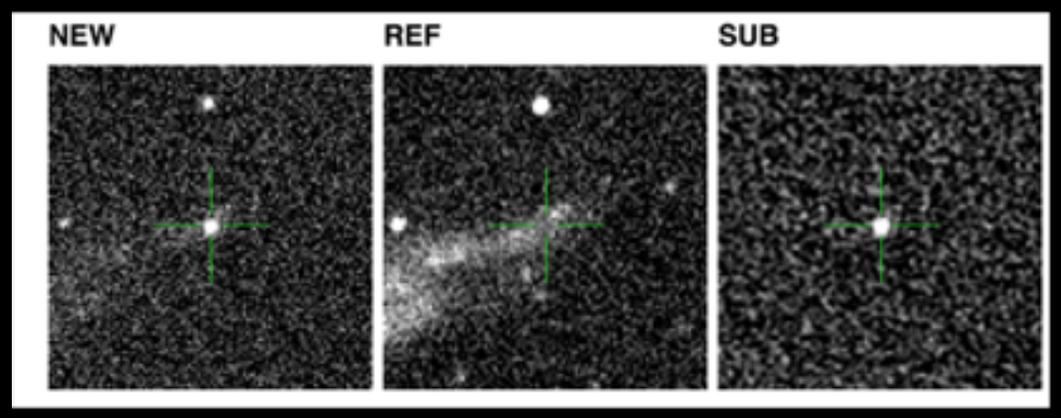
SEDM
(Spectral Energy Distribution Machine)
on P60

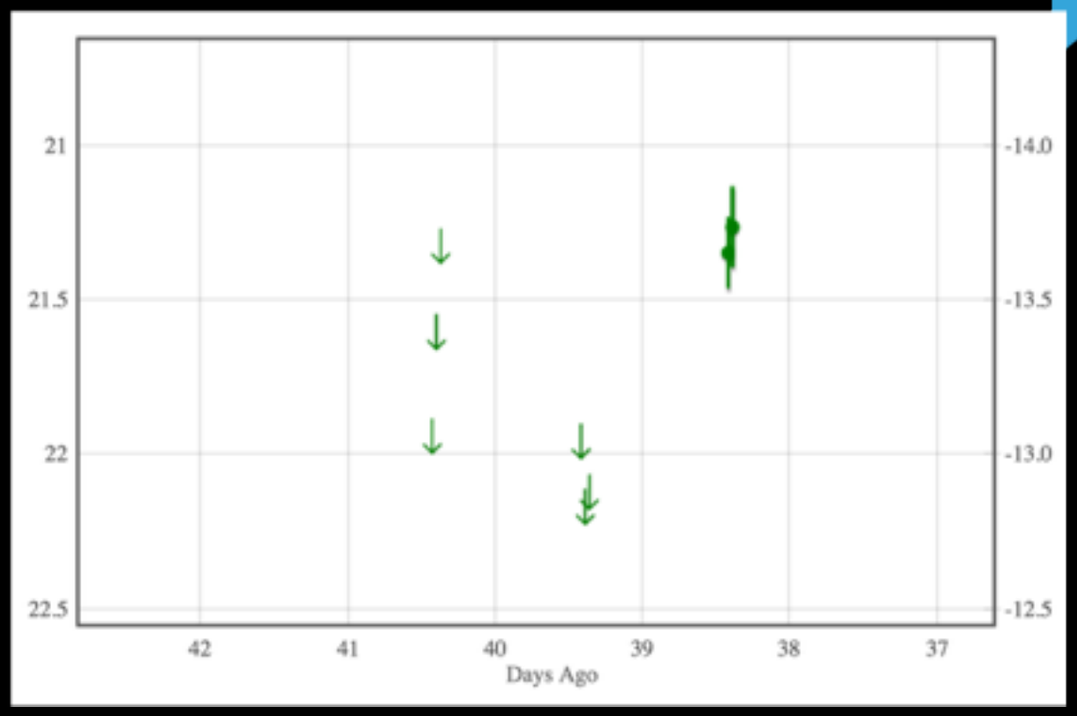
Nadia Blagorodnova
On behalf of the SEDM team
iPTF-ZTF Workshop - Friday 20th May 2016

TRADITIONAL APPROACH

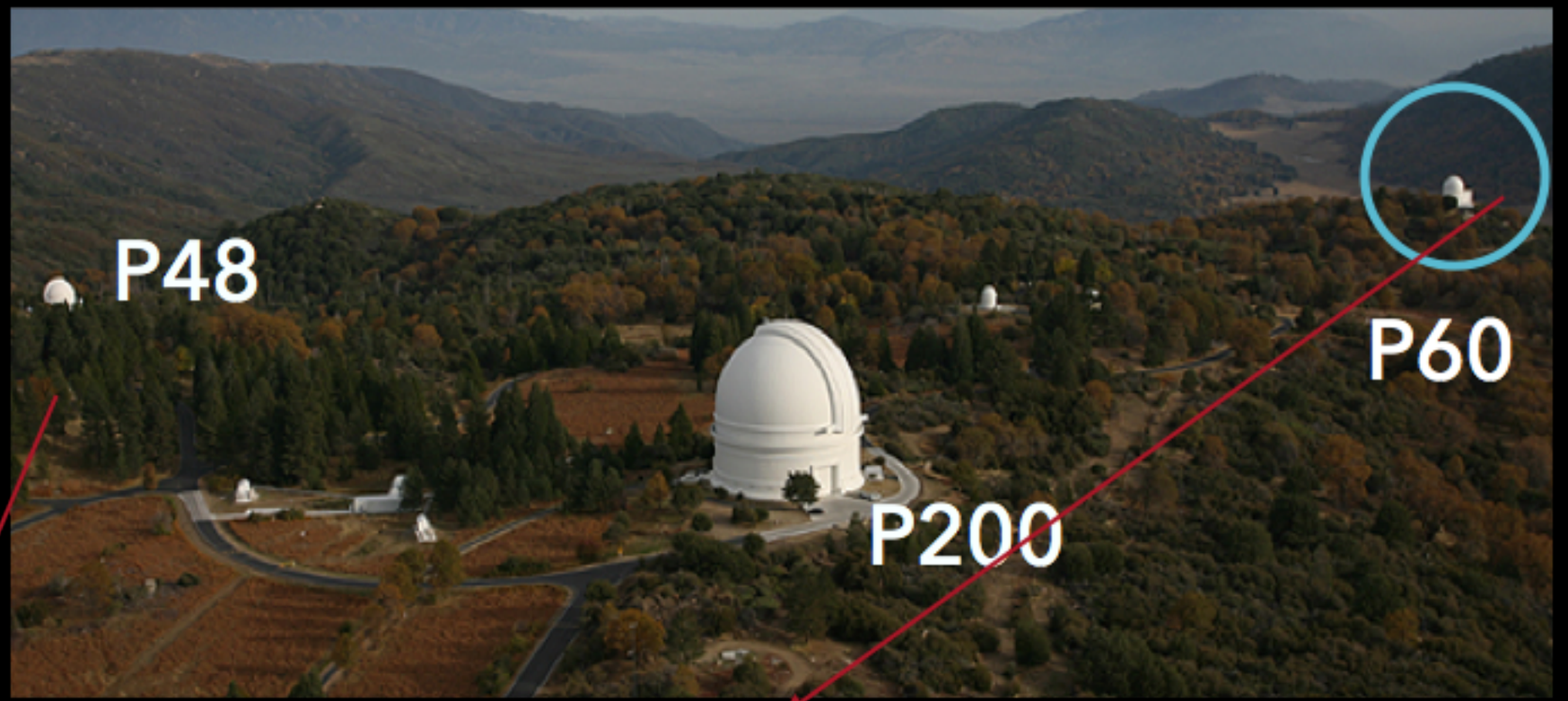


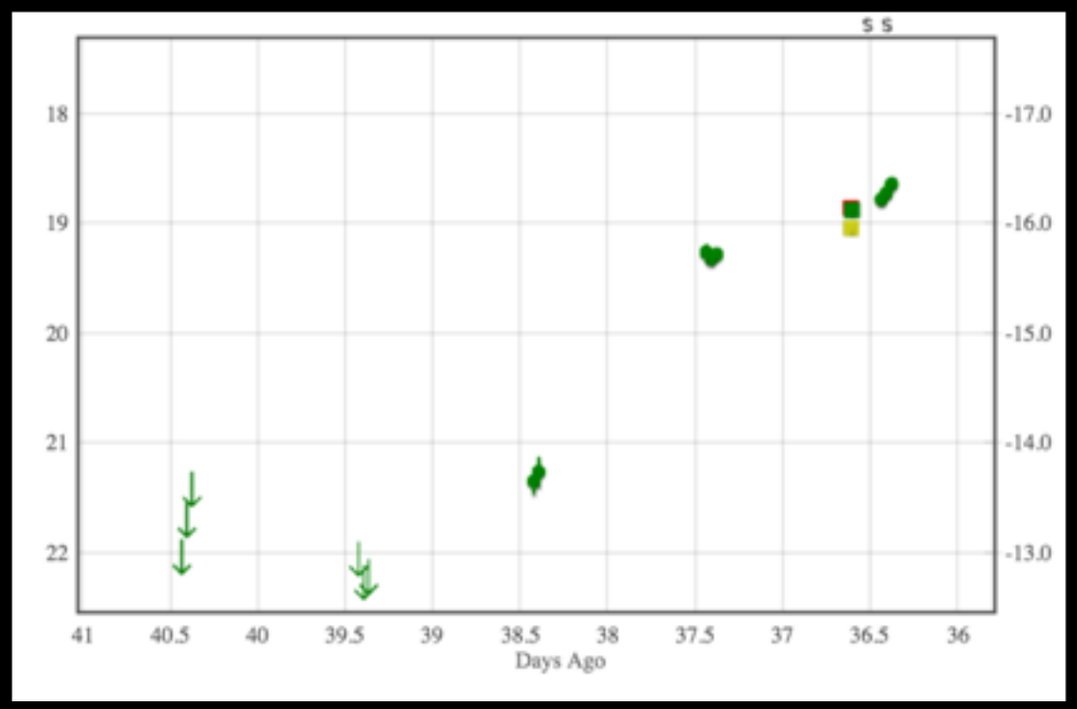
Discovery



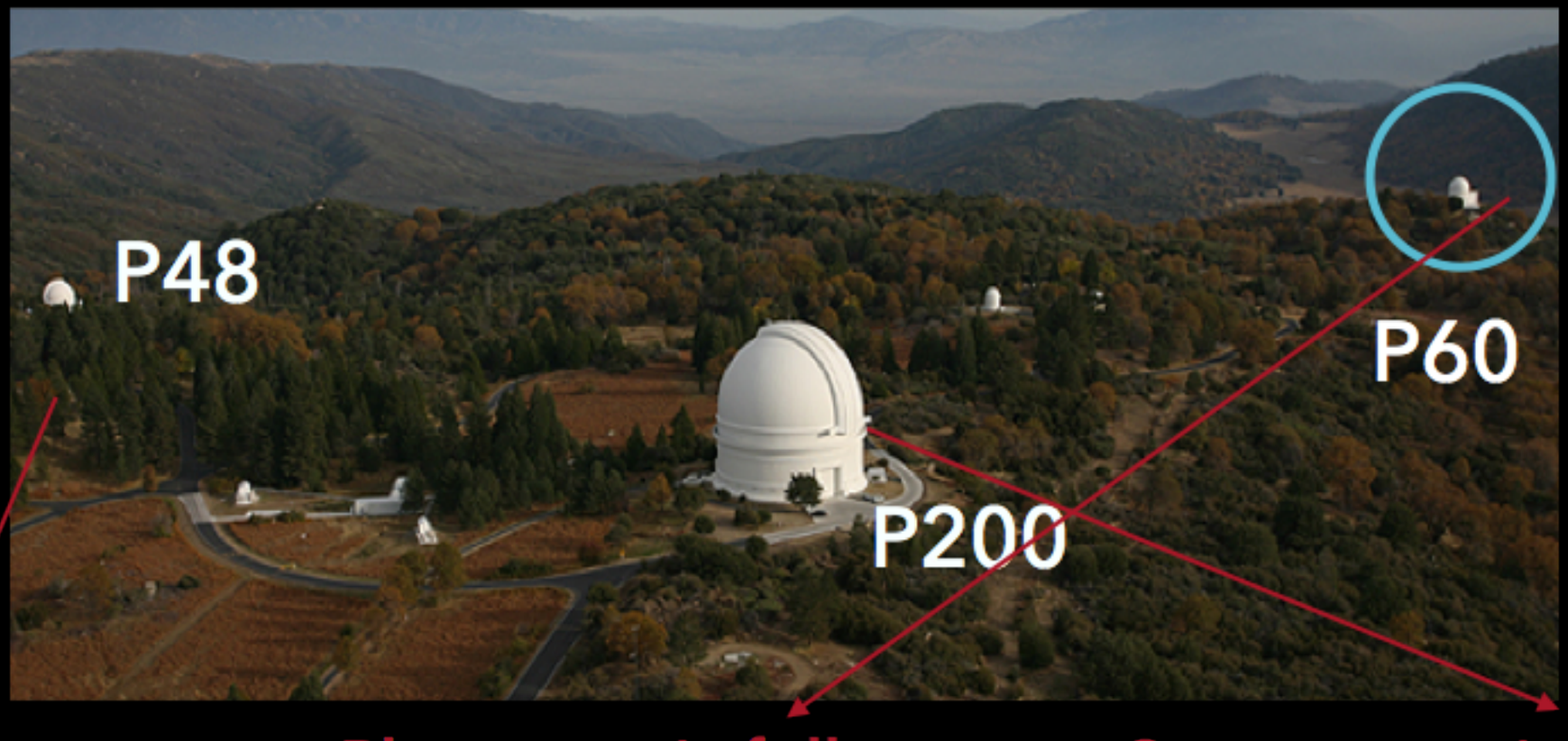


TRADITIONAL APPROACH

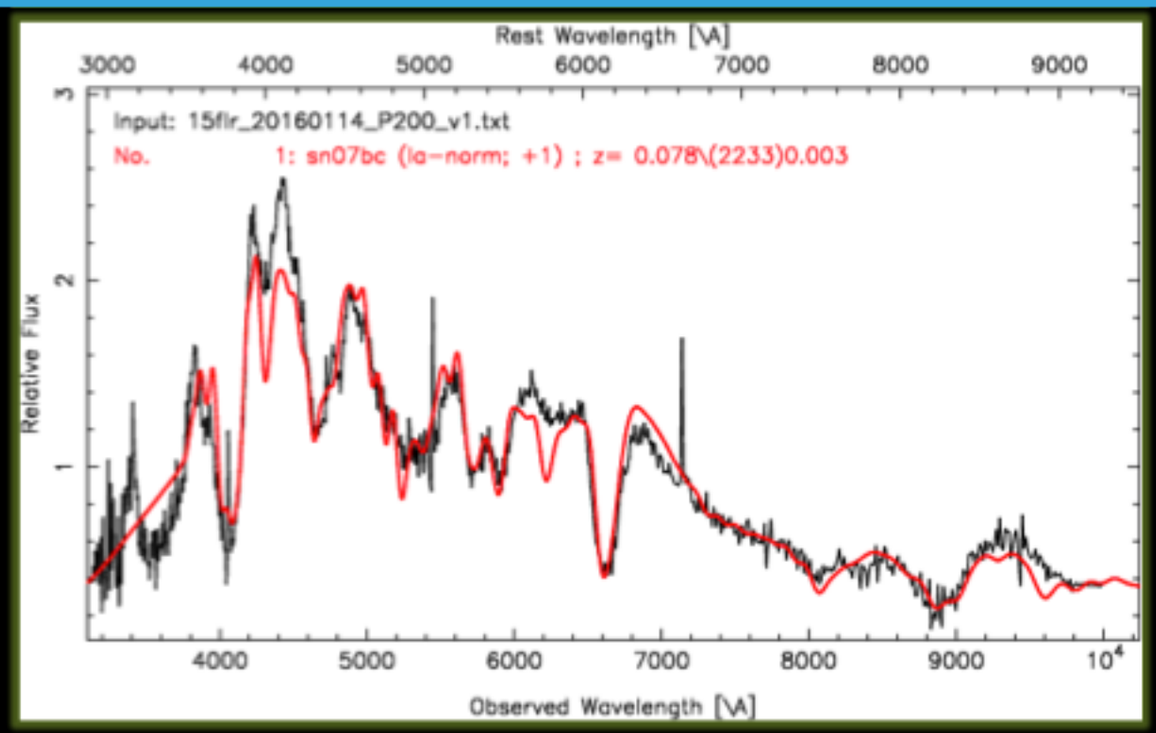




TRADITIONAL APPROACH

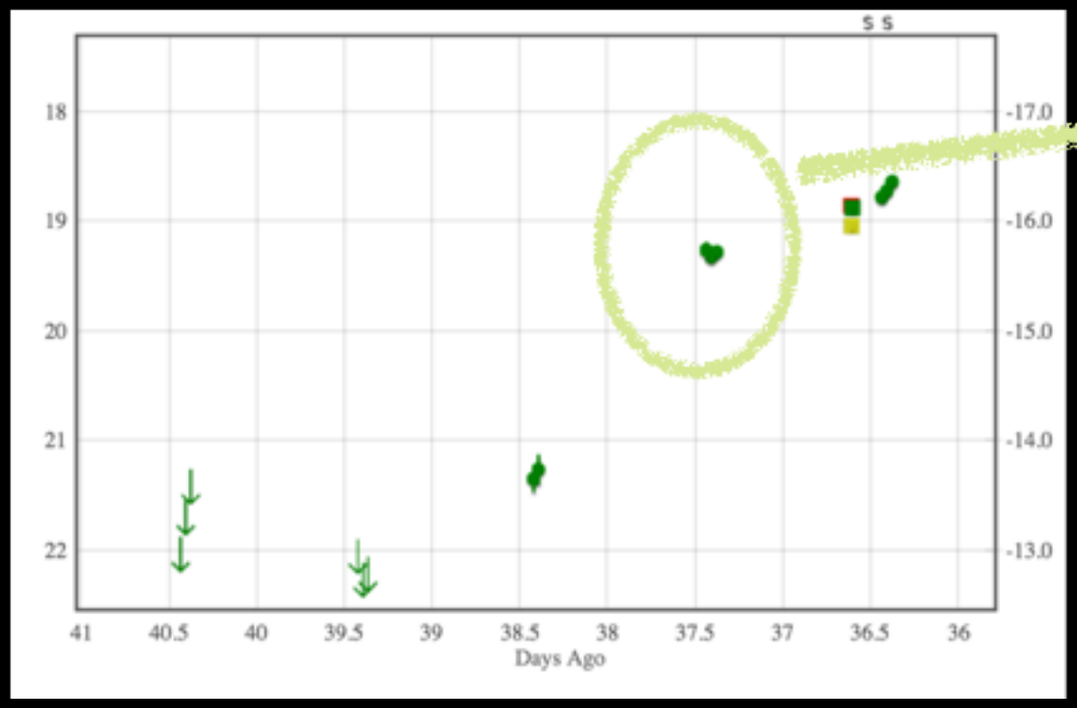


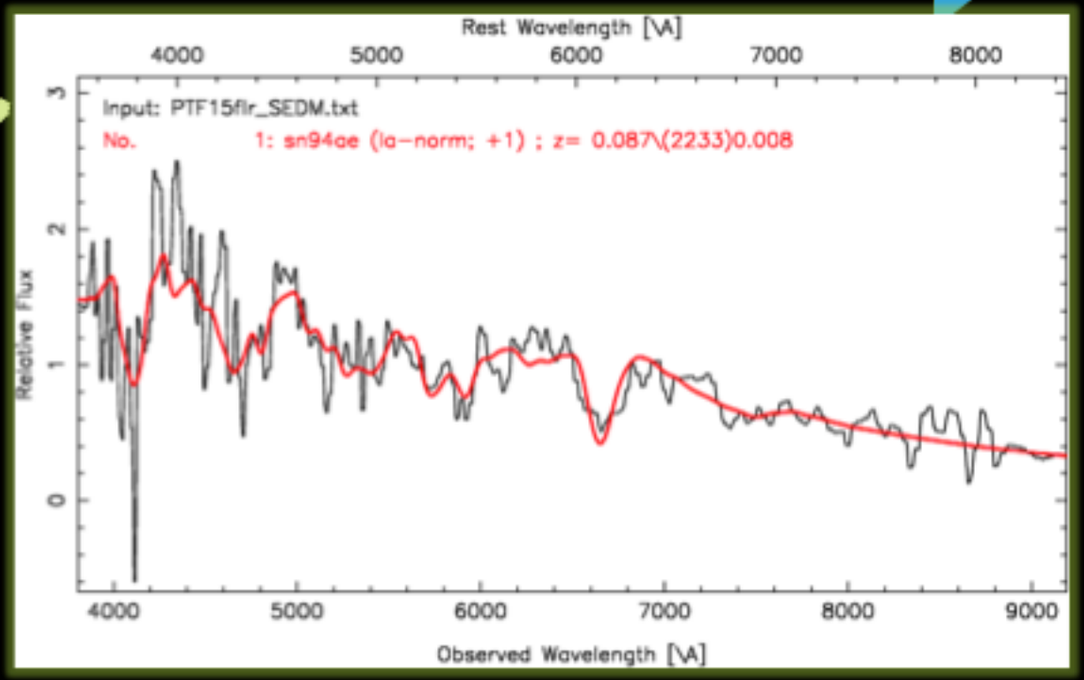
Discovery Photometric follow-up Spectroscopic classification



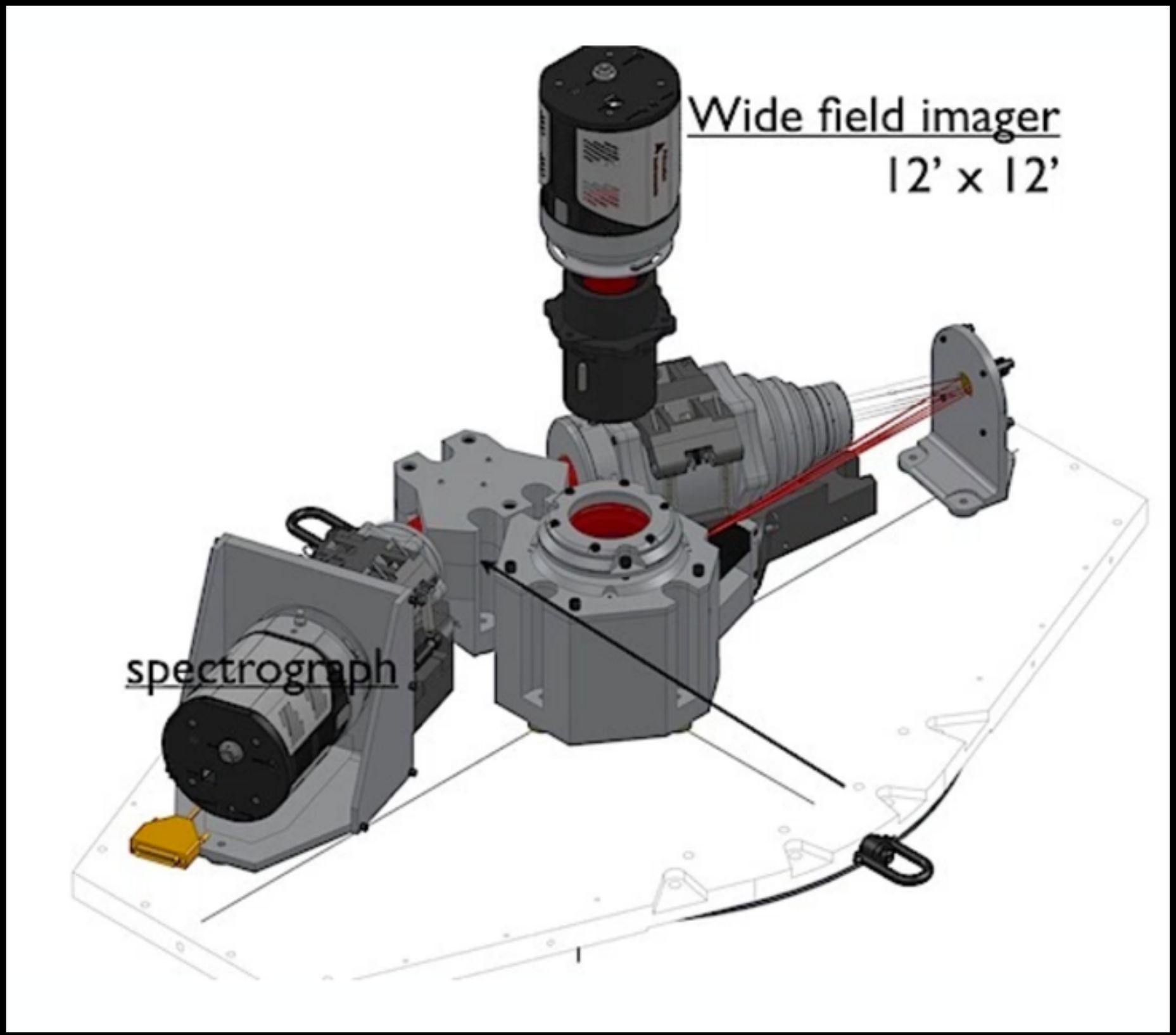
THE SHORTCUT APPROACH

Discovery → **Photometric follow-up + classification**

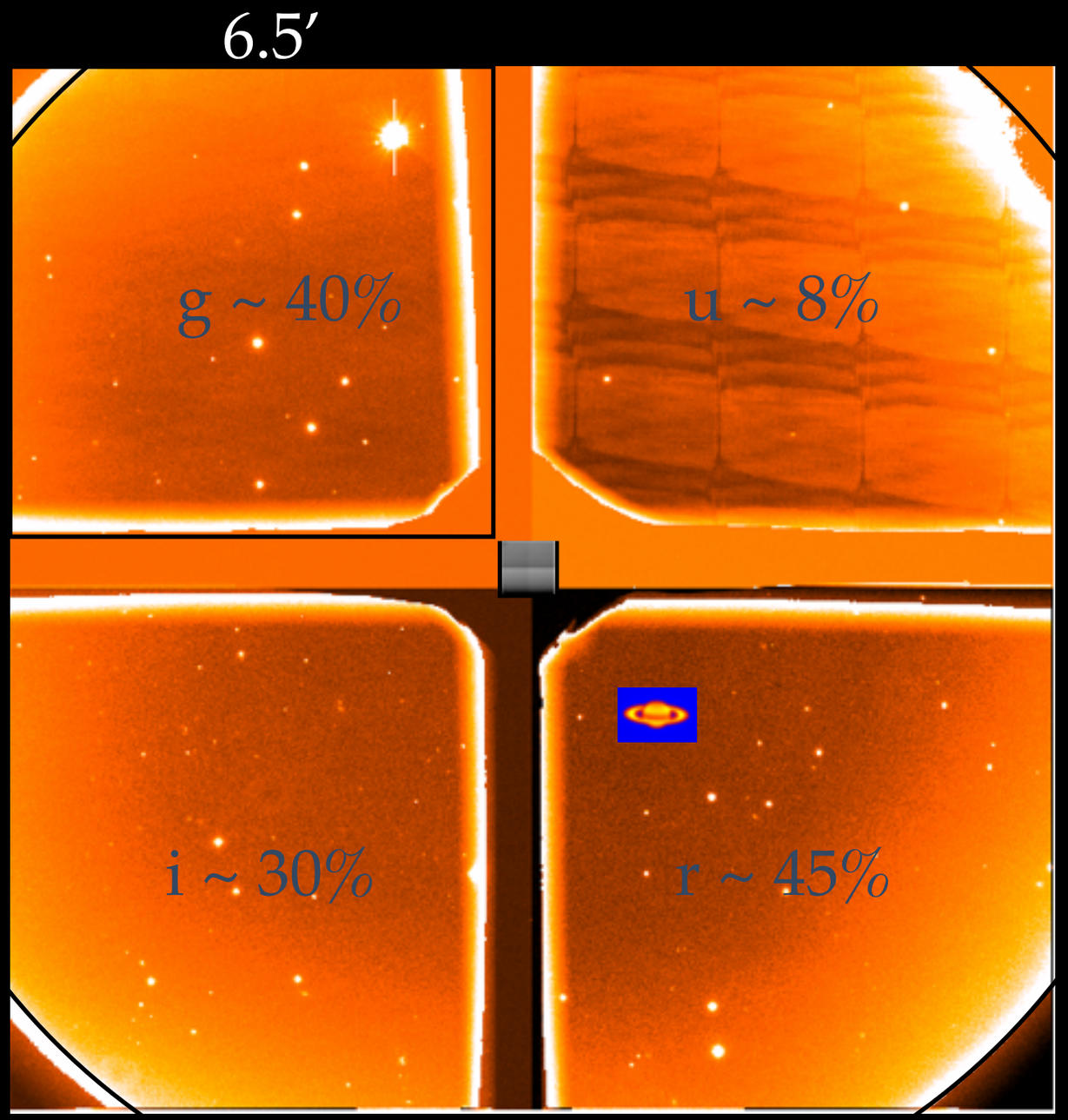




Hyperspectral imaging spectrograph

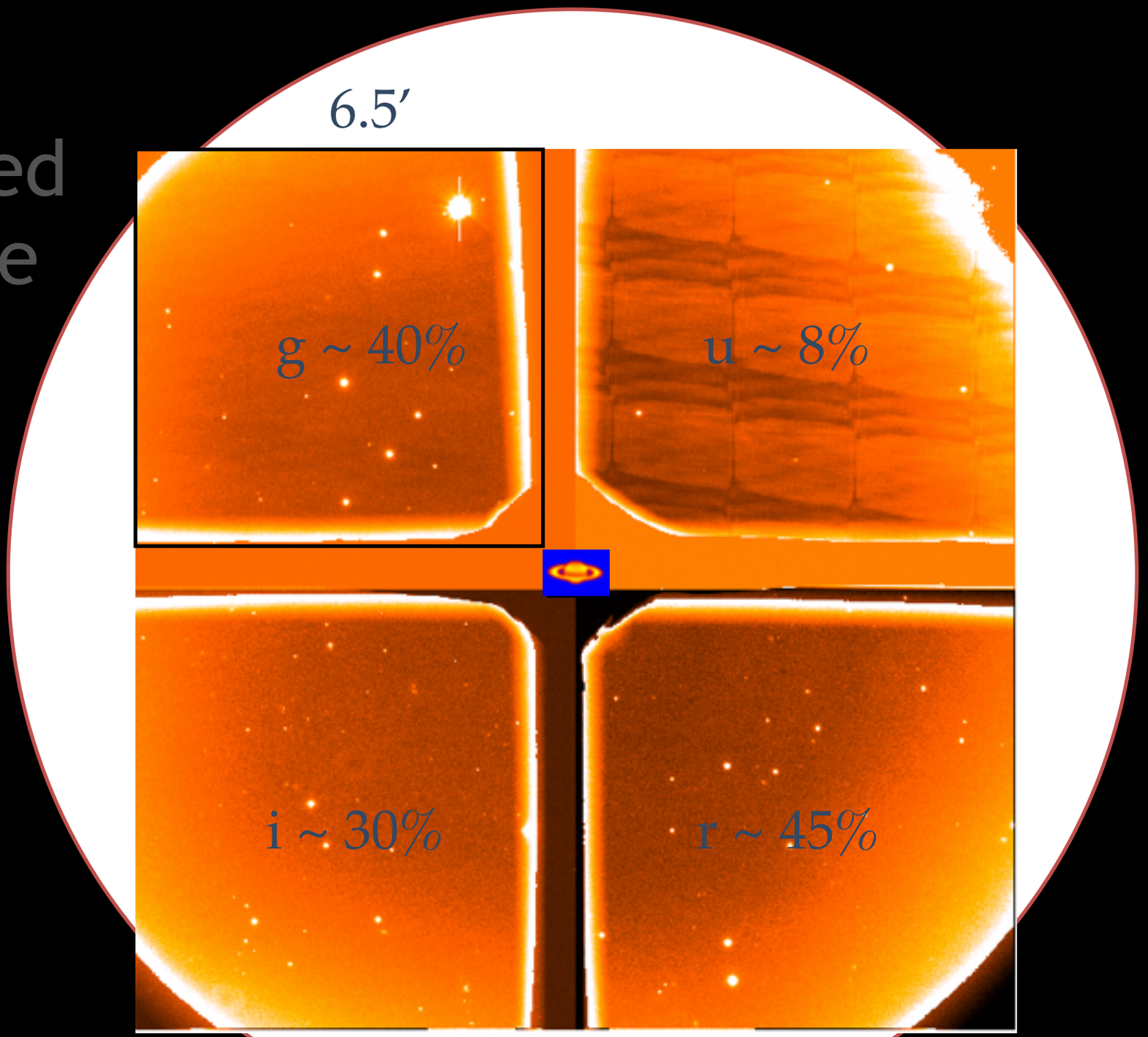


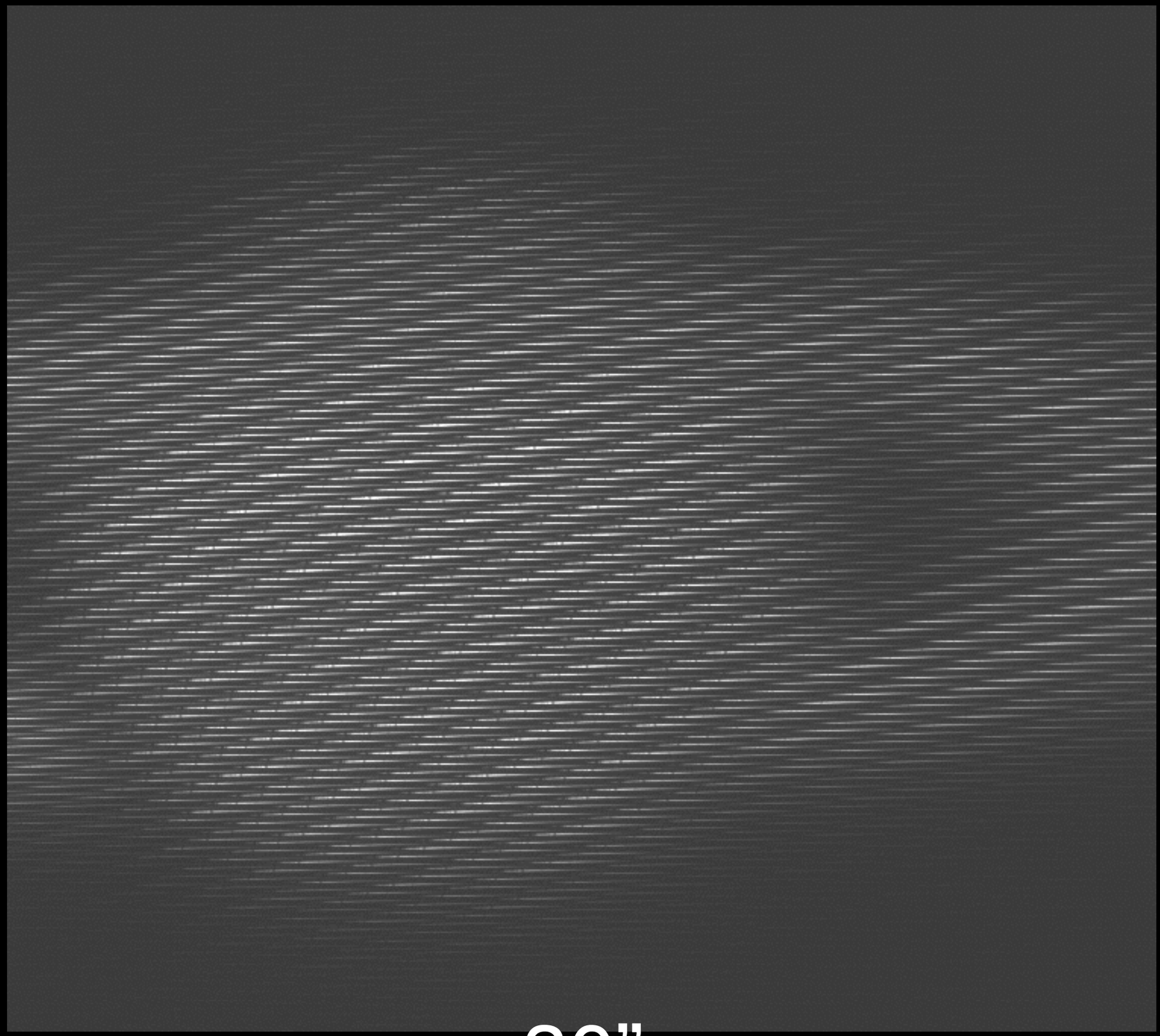
Rainbow camera imager: calibration + acquisition + guiding



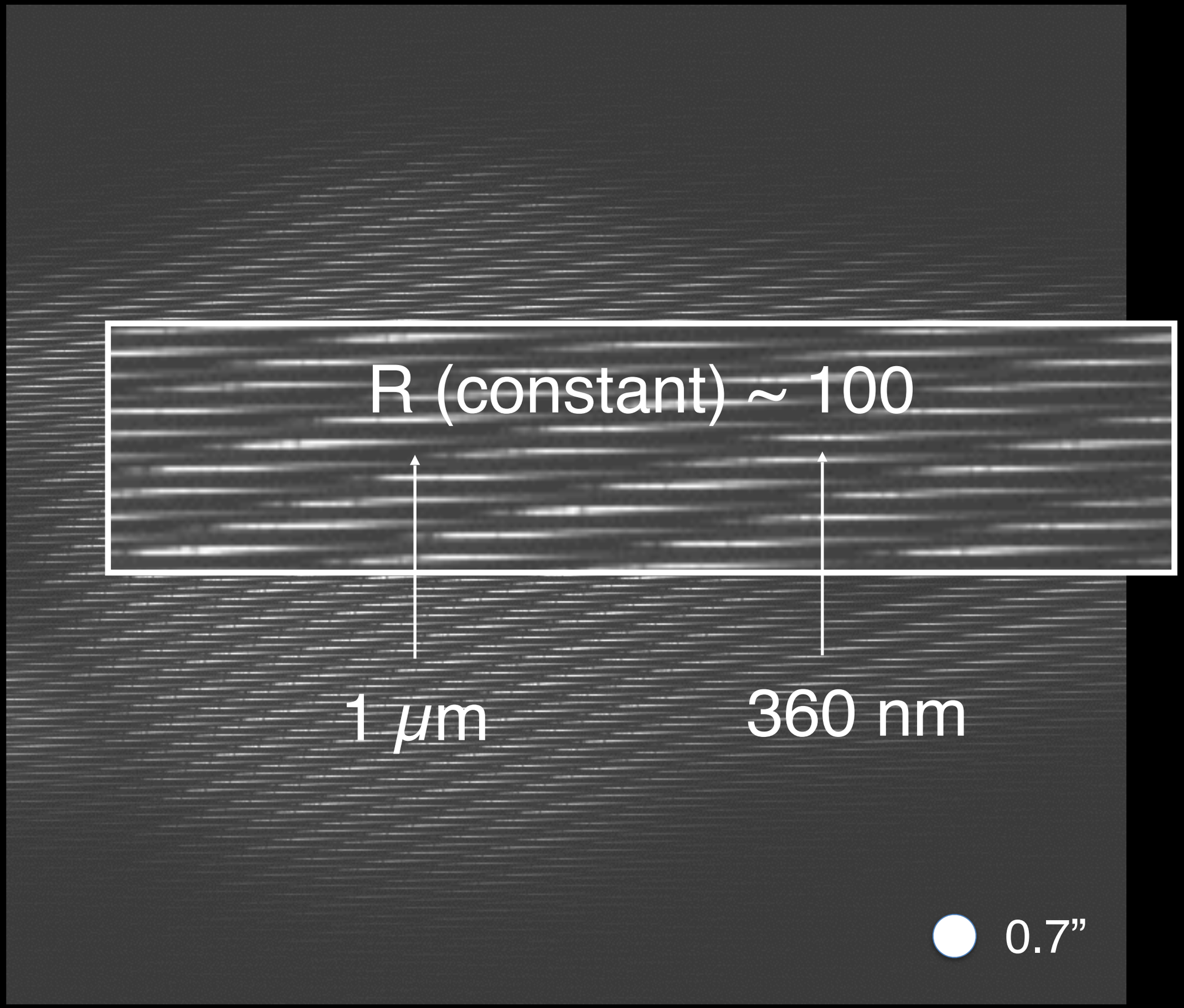
Rainbow camera imager

Unvignetted
ø17’ circle





30”



Data reduction is a big challenge!

Hardware UPDATE

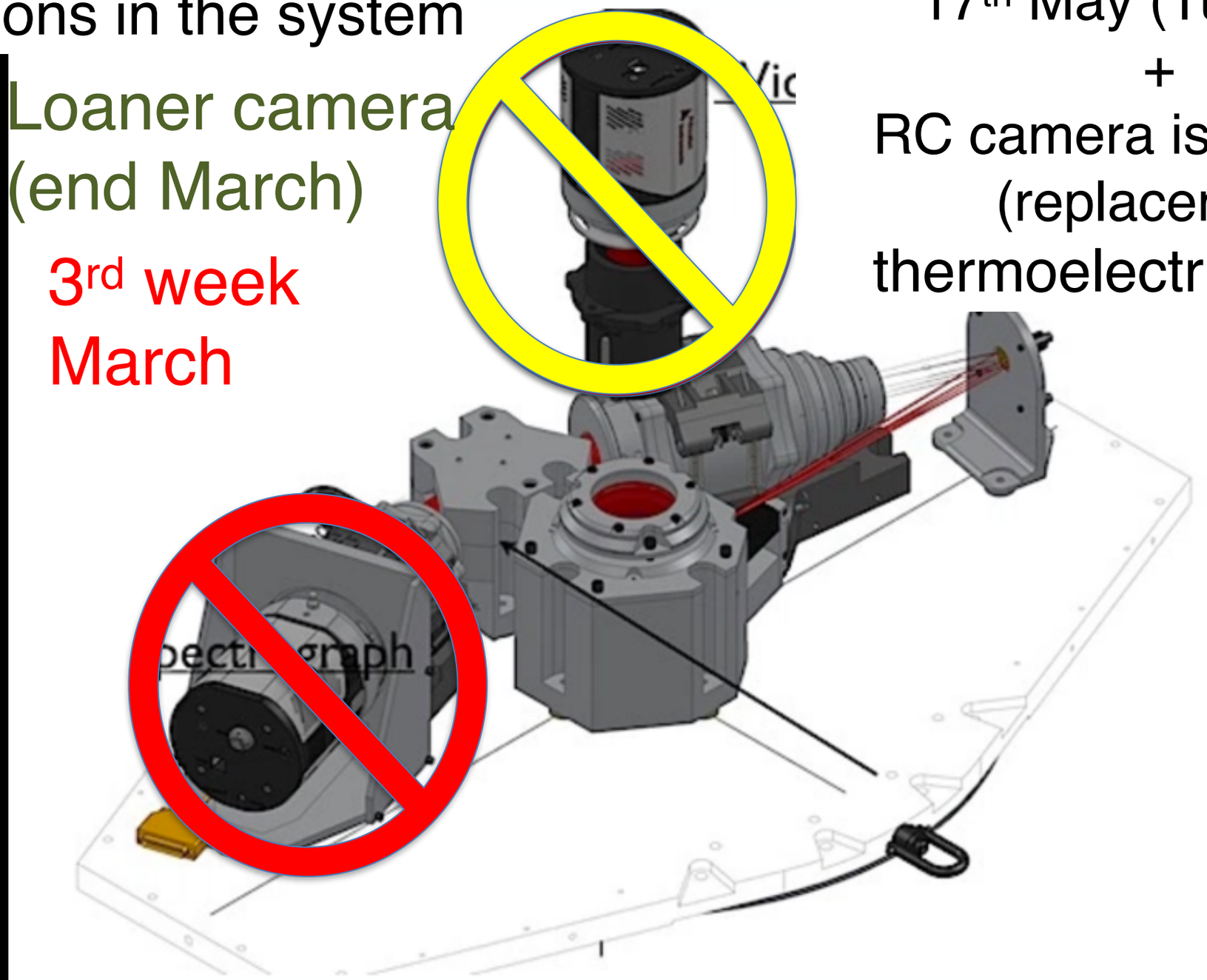
Loaner – Air cooled -->
minor vibrations in the system

Loaner camera
(end March)

3rd week
March

Beginning
March

End April



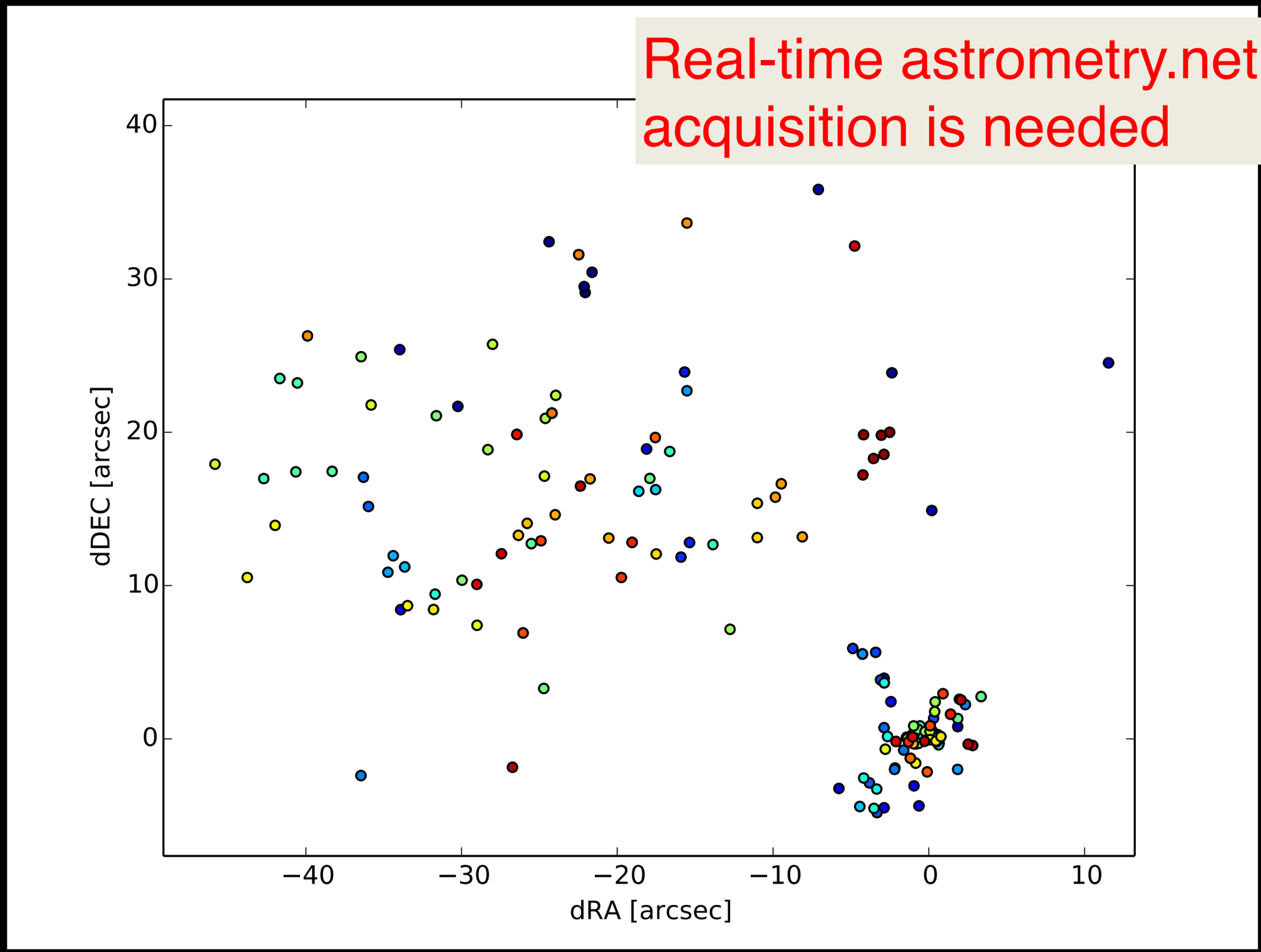
New camera shipped on –
17th May (Tuesday)
+
RC camera is on repair
(replacement
thermoelectric cooler)

Planned maintenance

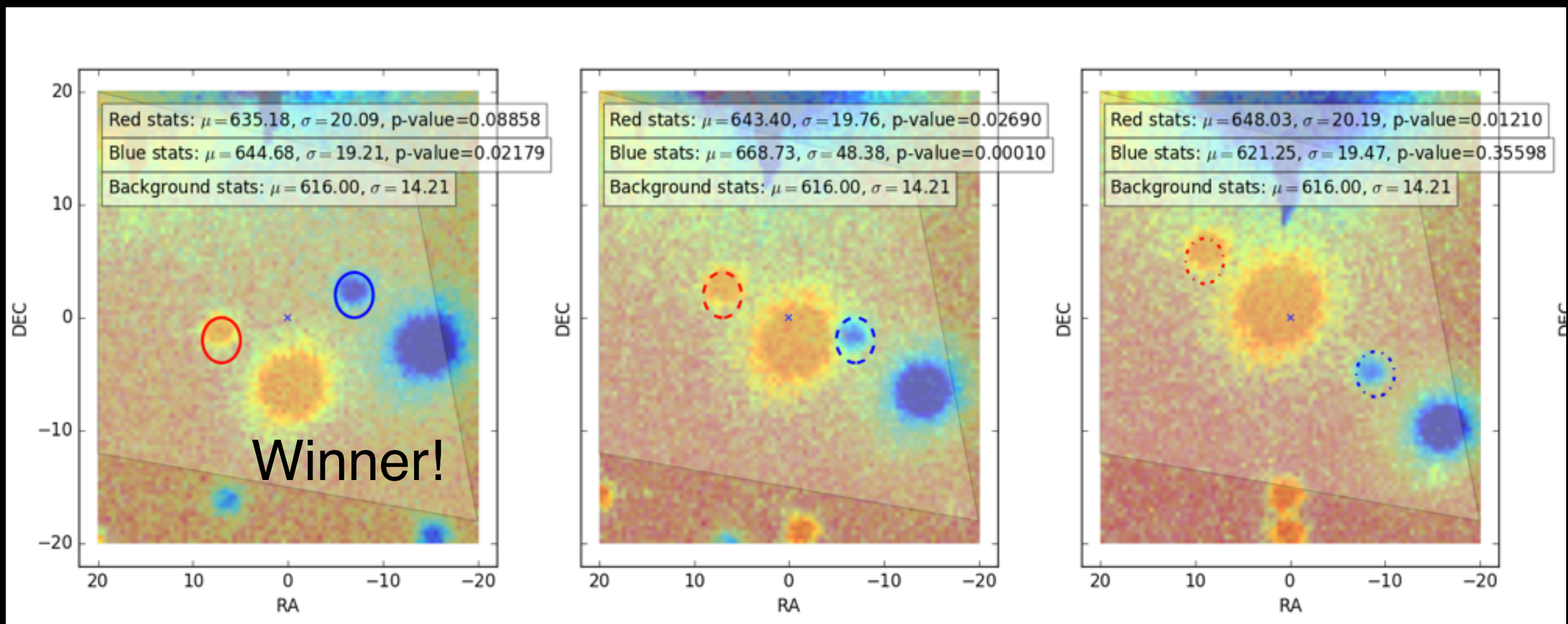
- Install the new camera in the RC slot to check its performance.
- Redesign for minor parts of the instruments. i.e. add spring in the flexure to make the return.
- Planned realuminization of the P60 secondary in August. 5- 10 days.
  - Major re-plumbing needs to happened then. Also to install the new pump in parallel.

Automatization steps

Real-time astrometry.net for acquisition is needed



Automatic offset selection for A-B pair



Automatic queuing system for SEDM

ADDITIONAL INFO

NED | TNS | SNEx | SIMBAD | VizieR | HEASARC | SkyView | PyMP | MPChecker | Extinction

CFHT | IPAC | DSS | WISE | Subaru | VLT | FIRST | CRTS | Variable Marshal (Search) | ADS

CURRENT FOLLOWUP REQUEST

ADD P60 FOLLOWUP

Select an observing sequence below.

Program: P60 Transient Vetting (PI = Shri Kulkarni)

Observing Group ✓ No Follow Up

1 (1=low, 5

- [SEDm]P60 Bright target:2day Cadence, expires in 5nights, griu
- [SEDm]Vetting: 1 visit, expires in 1 day, gri
- [SEDm]Full SED snapshot, 1 visit, expires in 1 day, griu
- [SEDm]TDE Candidate 5d cadence, expires in 15days, ugr
- [SEDm]Newborn SN: 1hr cadence, 7 visit/night, expires in 2 days, griu
- [SEDm]GRB afterglow: 1hr cadence, 5visit/night, expires in 1 day, gri
- [SEDm]Young SN: 1d cadence, expires in 7 days, griu
- [SEDm]Two-epoch vetting: 2 visits, expires in 8 days, gri
- [SEDm]Late-time SN: 6d cadence, expires in 30 days, gri
- [SEDm]IFU 1d Snap Shot+gri, 1visit, expires in 1 day
- [SEDm]IFU 1 visit, expires in 1 day

ASSIGNMENTS

Add to: 2016-05-

Request Type:

Comment:

Reduction pipeline available on pharos

www.astro.caltech.edu/sedm/Quick.html

PESSTO | Calendar | SAO/NASA ADS Cust | Bookmarks | (TWiki login) WebHor | SNEx - The Supernov | PTF | Bogumił Pilecki | Gaia Alerts Index

Table Of Contents

This Page

Show Source

Quick search

Go

2. Quick Reference for Observers

We are in the process of developing an automated system for data reduction and analysis. Currently, the only interactive step in the data reduction is placing the aperture(s) on the object(s). For PTF followup, the data are usually taken in A/B pairs to improve the sky subtraction. This requires that the observer place an aperture on the A position (positive: red) and on the B position (negative: blue). See below for a step-by-step procedure. These steps may eventually be automated, depending on how robust and accurate our astrometry turns out to be.

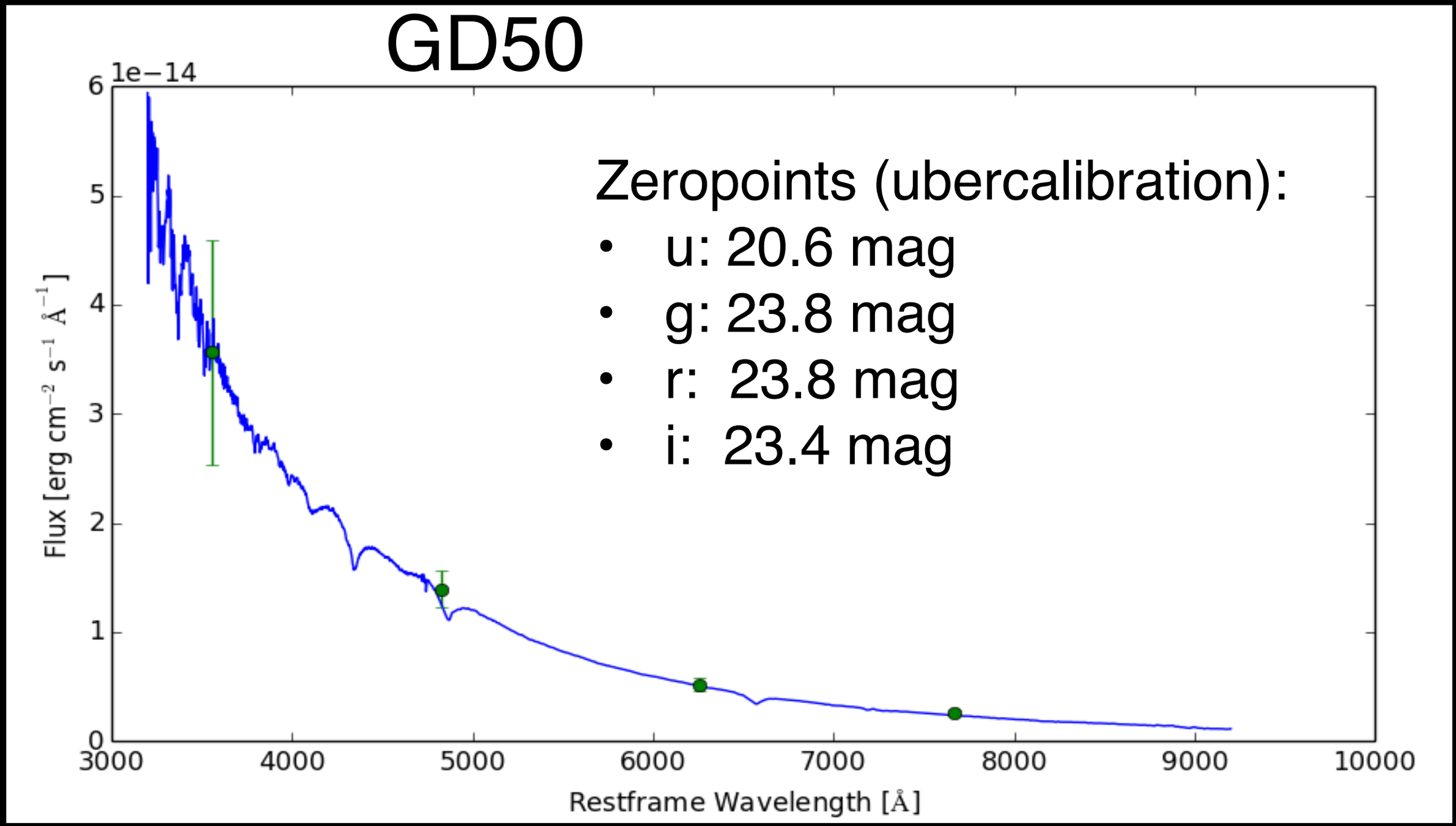
Once the apertures have been placed, all that remains is to generate an ascii spectrum of the object and then run your favorite classifier. SNID is provided, but the format is universal enough to be input to any classifier (Superfit, e.g.). The final step is uploading the spectrum and any classification data (type, age, redshift, template figures) to the PTF marshal. For this, we suggest you use your own account so you are recorded as the observer.

2.1. Pre-observing scripted reductions

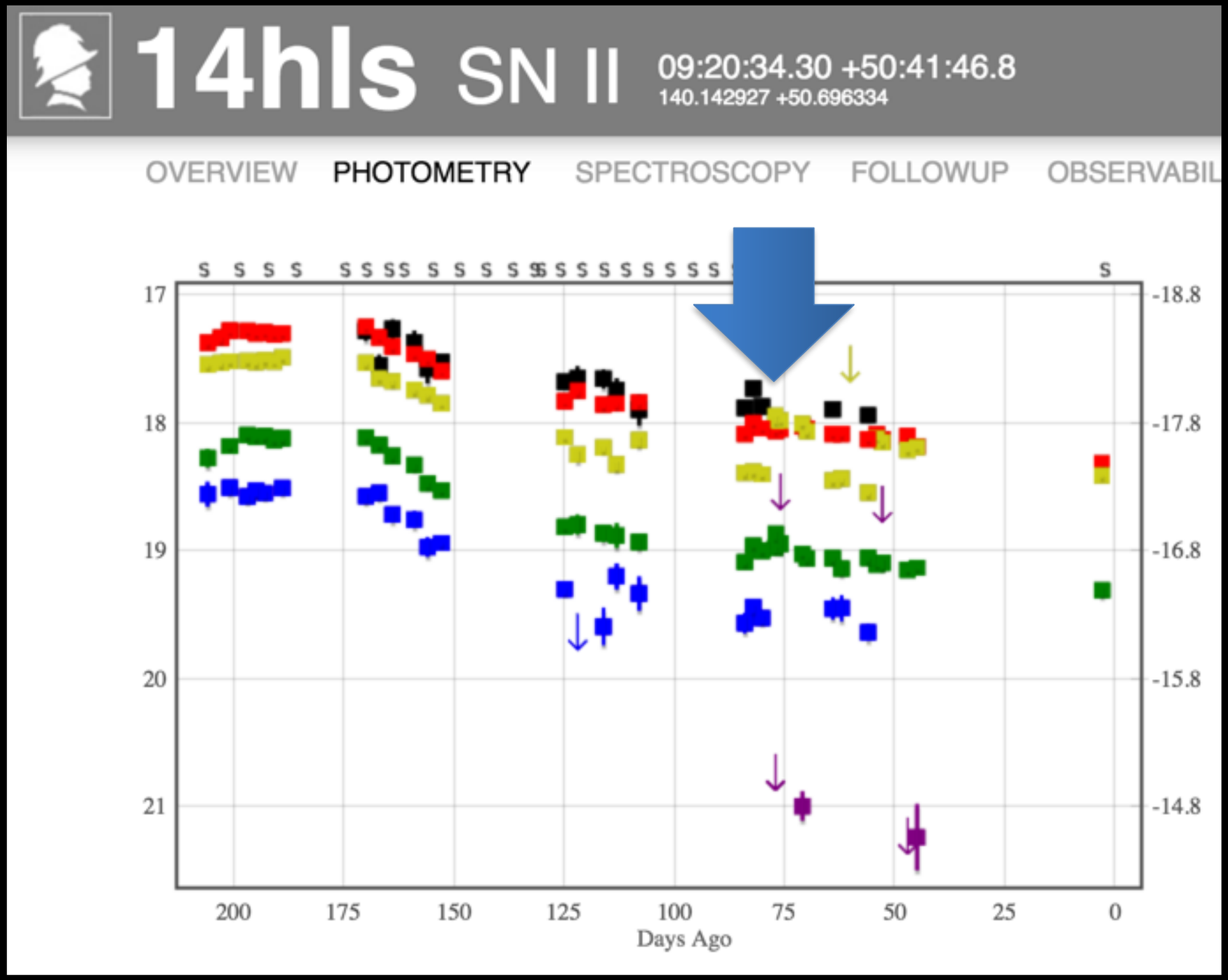
Before the observer interacts with the pipeline, the following steps are automatically performed:

1. The appropriate reduced directory is created using the UT date:

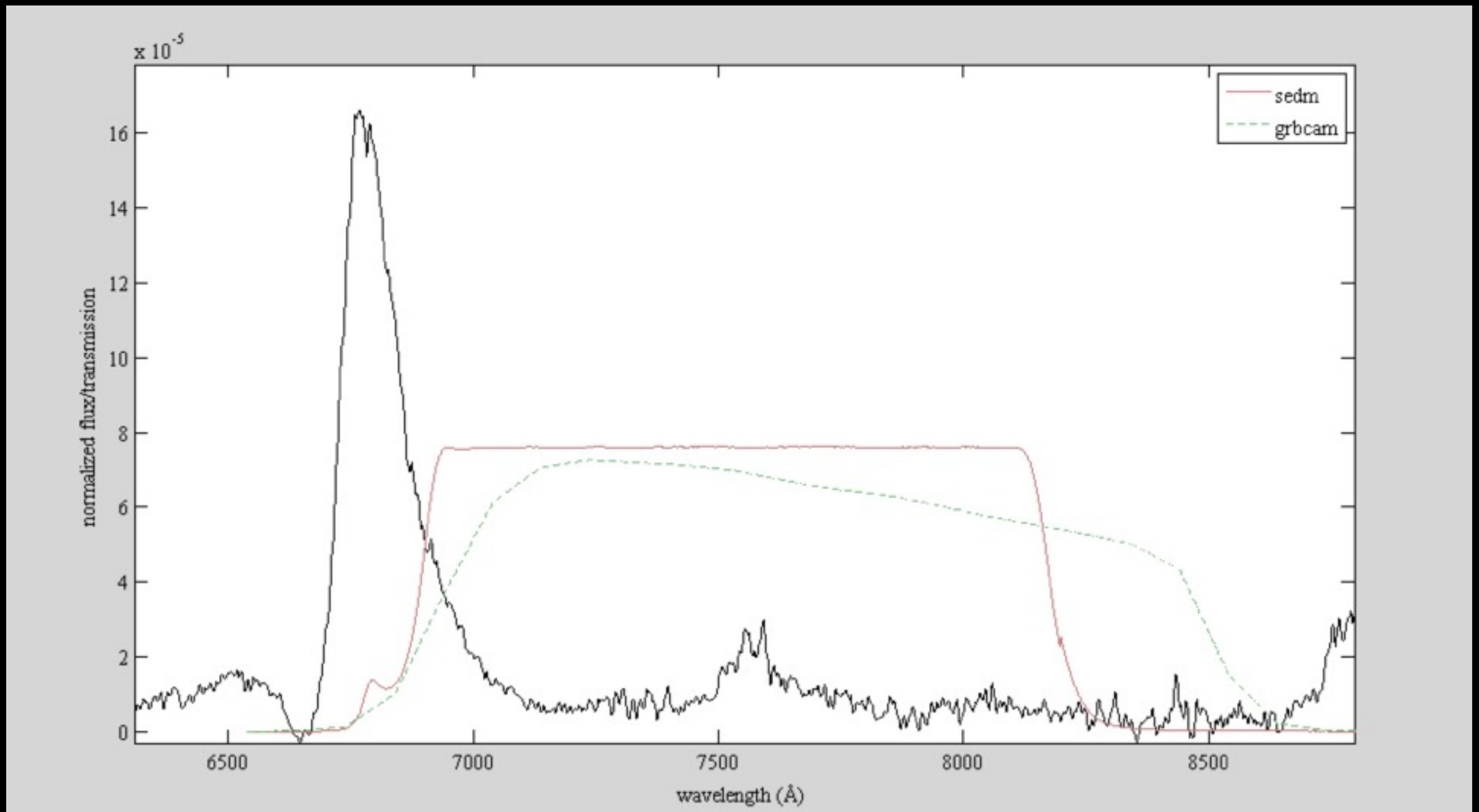
Automatic reduction
ugri photometry



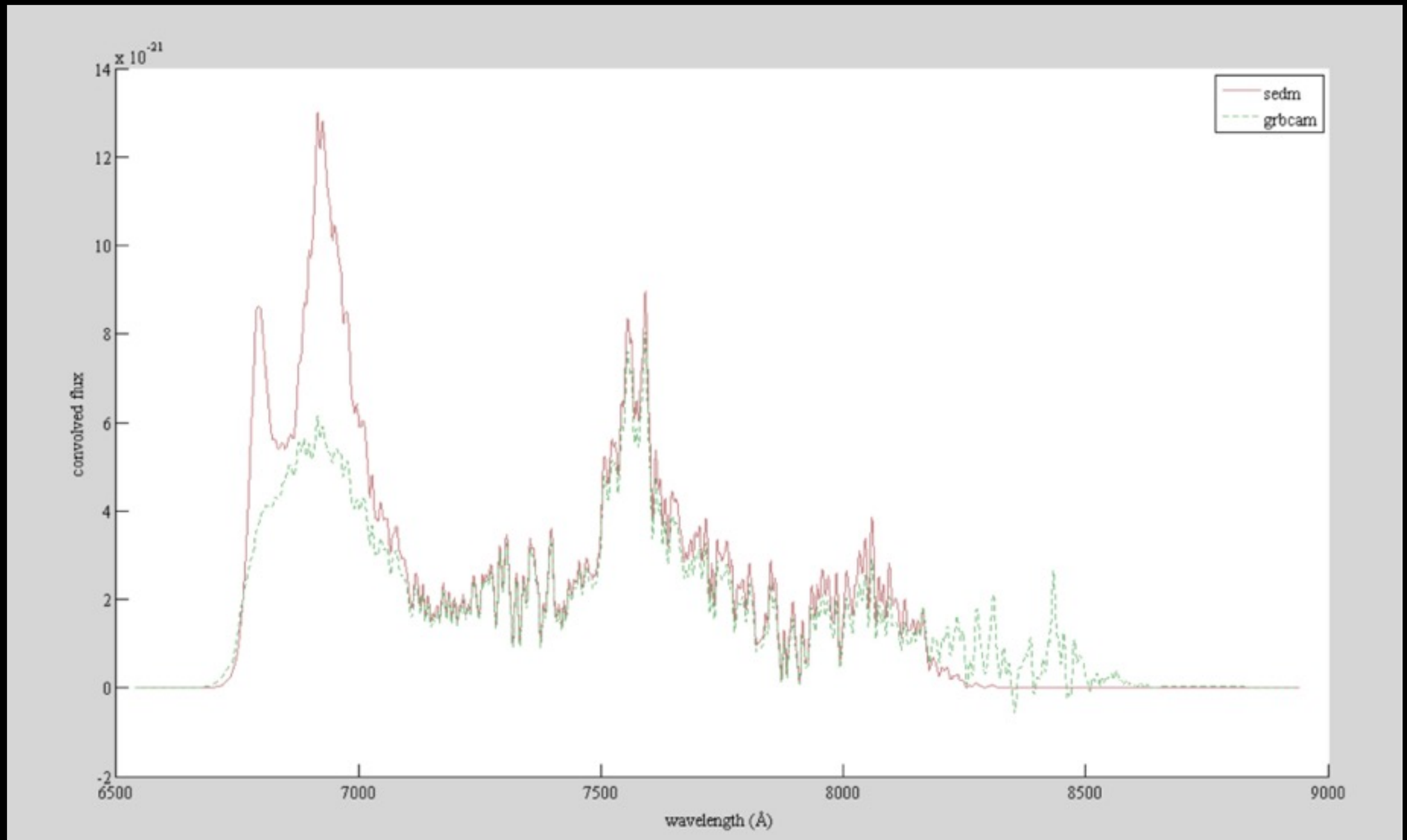
Automatic (Fremling) photometry for SDSS fields



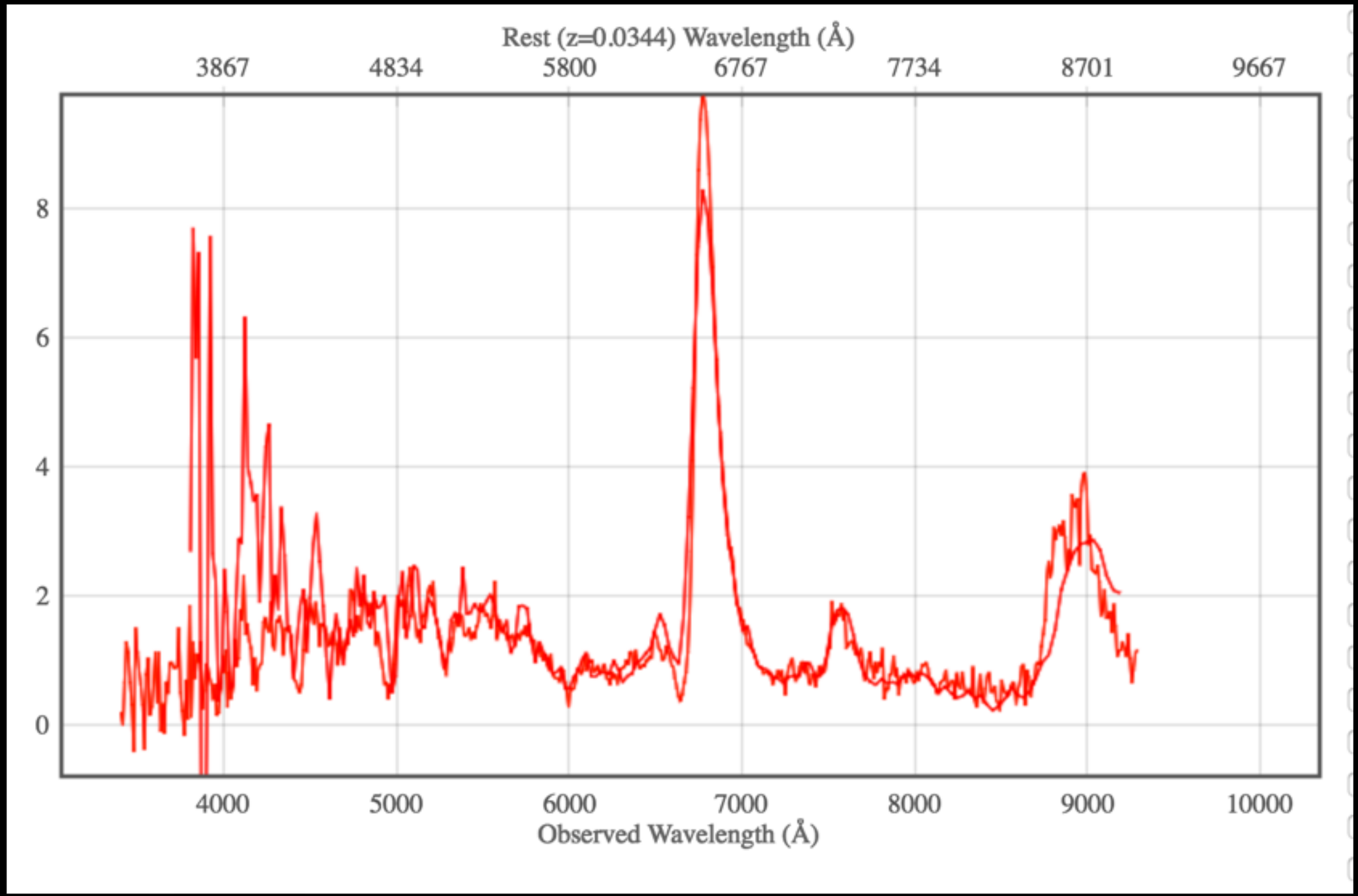
GRB i-band != SEDM i-band



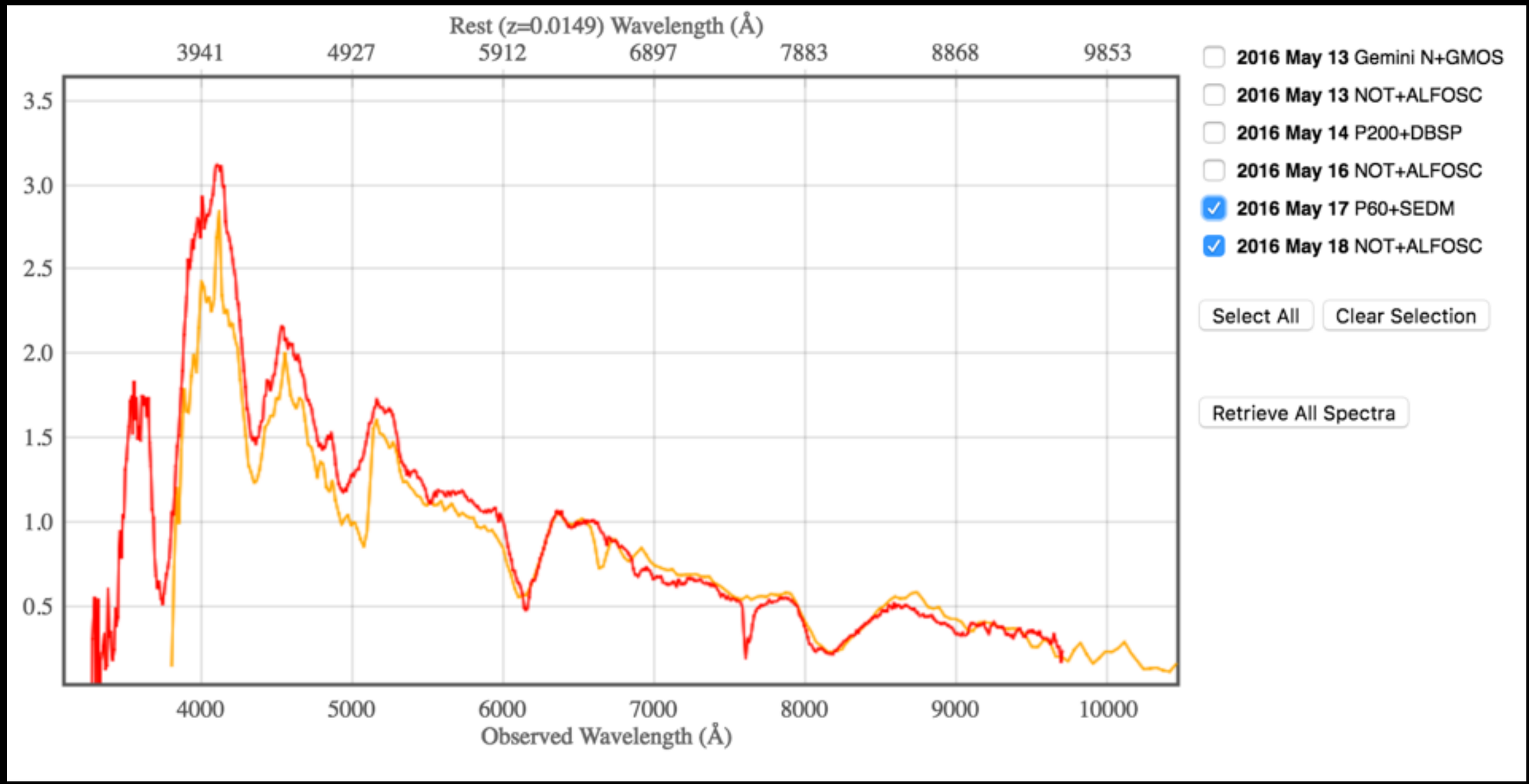
Only for specific objects



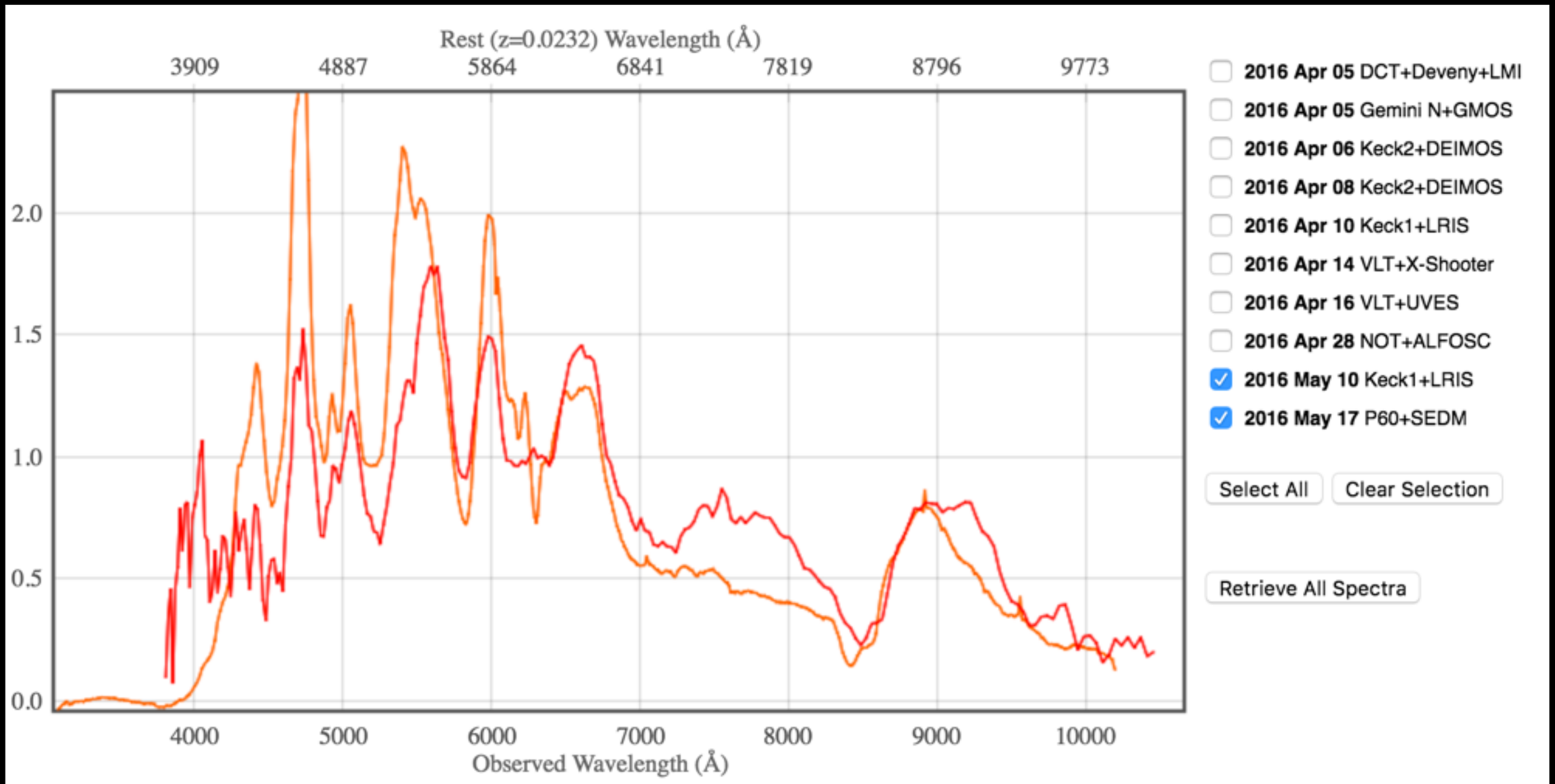
SEDM (1800s)
vs. FLOYDS (3600s)



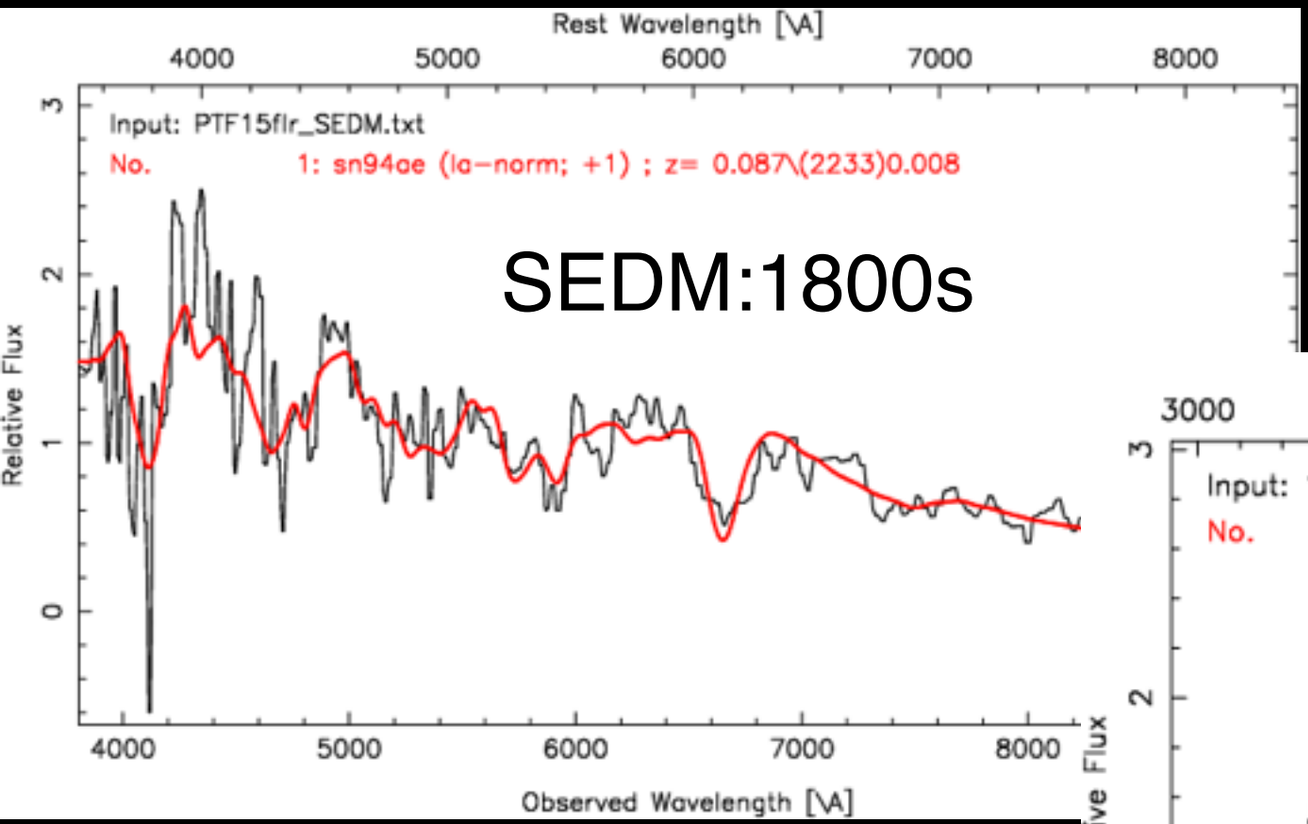
SEDM vs. ALFOSC



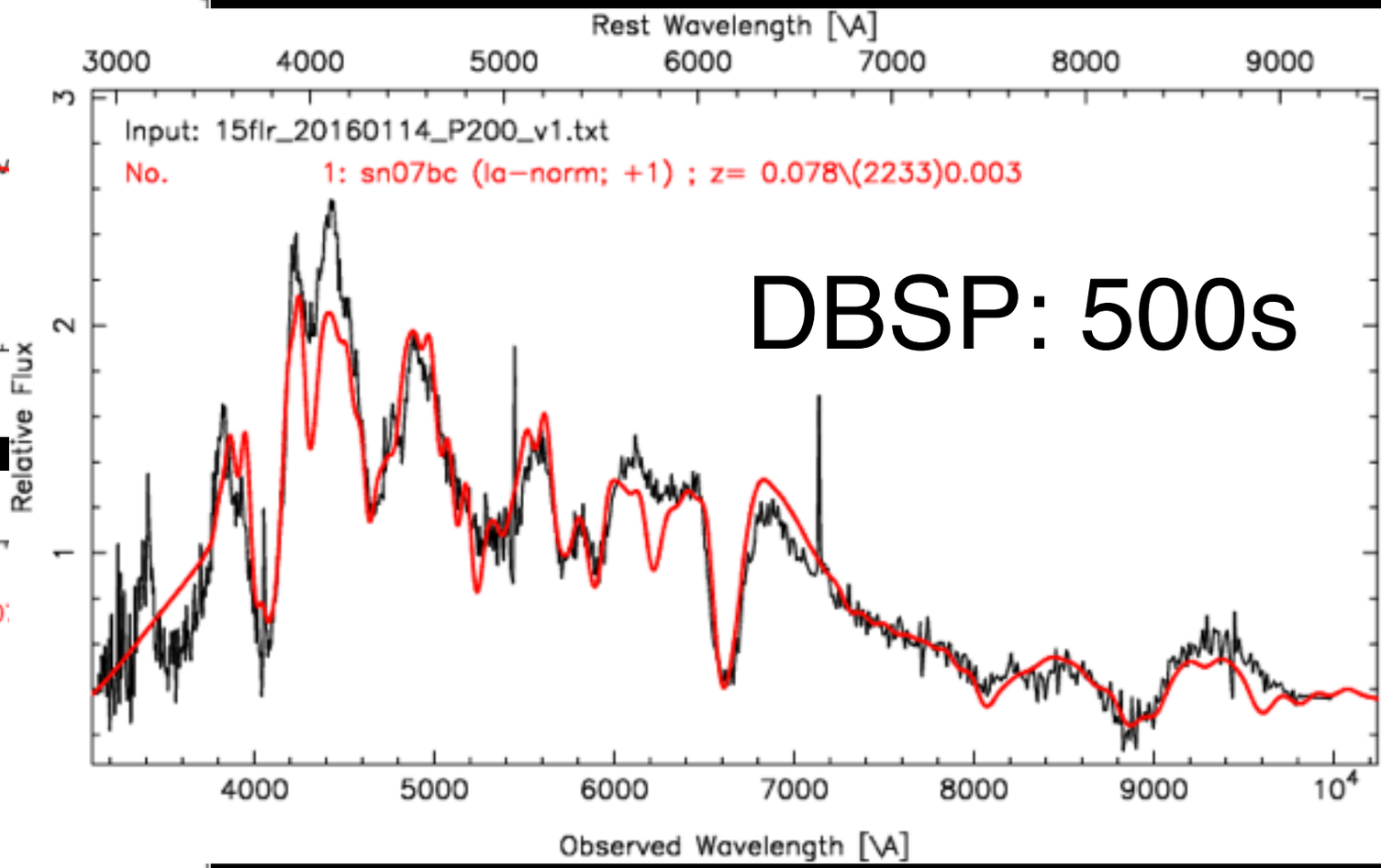
SEDM vs. LRIS


Rest (z=0.0232) Wavelength (Å)
3909
4887
5864
6841
7819
8796
9773
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000
Observed Wavelength (Å)
2016 Apr 05 DCT+Deveny+LMI
2016 Apr 05 Gemini N+GMOS
2016 Apr 06 Keck2+DEIMOS
2016 Apr 08 Keck2+DEIMOS
2016 Apr 10 Keck1+LRIS
2016 Apr 14 VLT+X-Shooter
2016 Apr 16 VLT+UVES
2016 Apr 28 NOT+ALFOSC
2016 May 10 Keck1+LRIS
2016 May 17 P60+SEDM
Select All
Clear Selection
Retrieve All Spectra

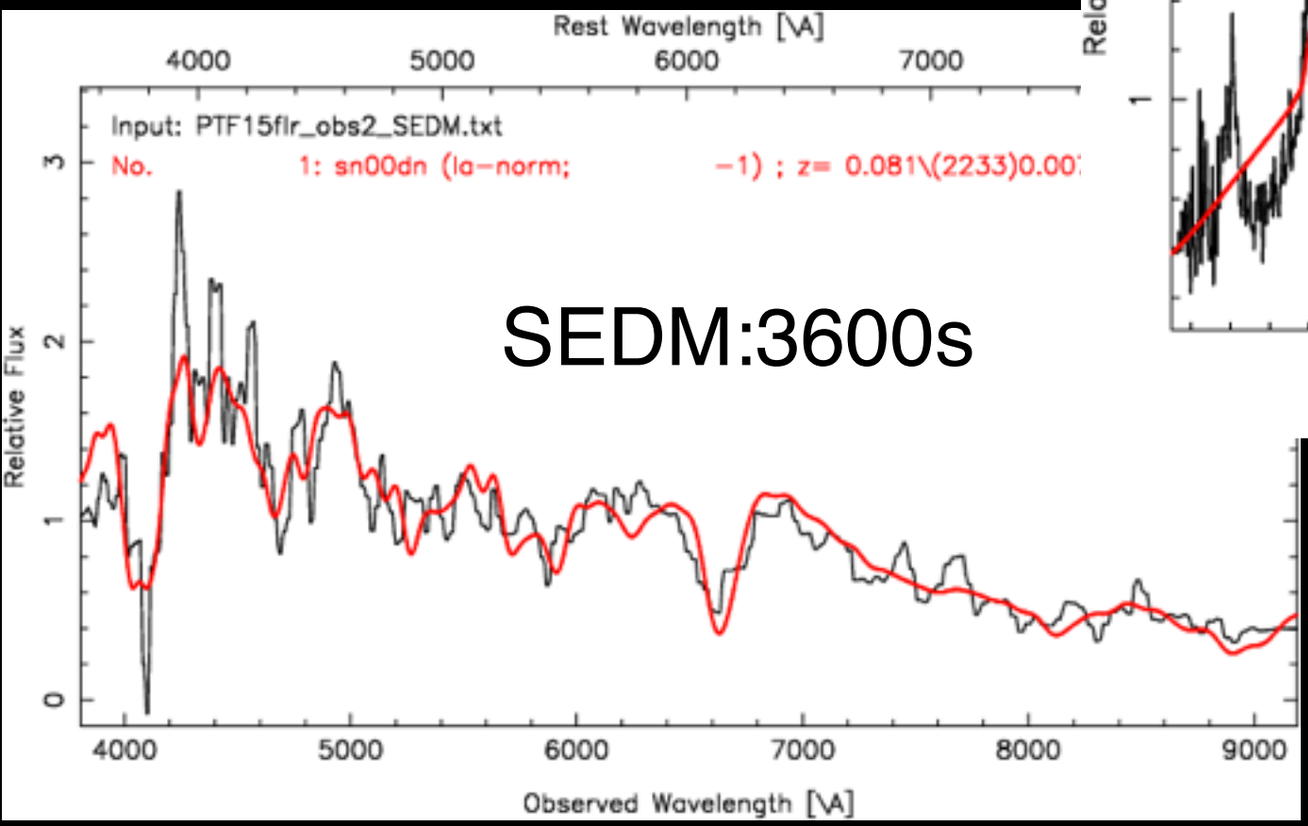
Transient Classification with SNID



SEDM:1800s



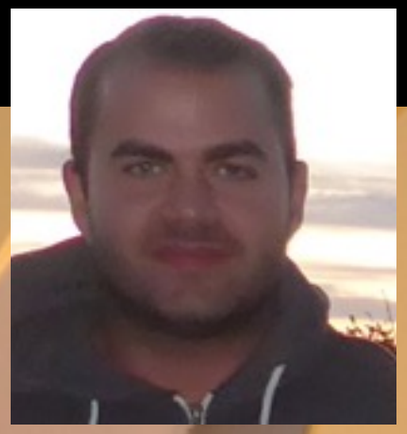
DBSP: 500s



SEDM:3600s

SEDM Commissioning Status

- Spectral extraction takes < 30min
- Automated Std-star extraction
- Automated photometry reduction + automatic pipeline in SDSS fields
- Current effort:
  - Improve instrument hardware stability – hardware
  - Automatic tests for pipeline monitoring
  - On-site machine to run night astrometry + reductions
- Aim to commission in Aug (16B)



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Nadia Blagorodnova [Ph]

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Richard Walters [P60]