

Gaia Alerts Contributions by The Open University

MEREDITH MORRELL – 2018/10/02

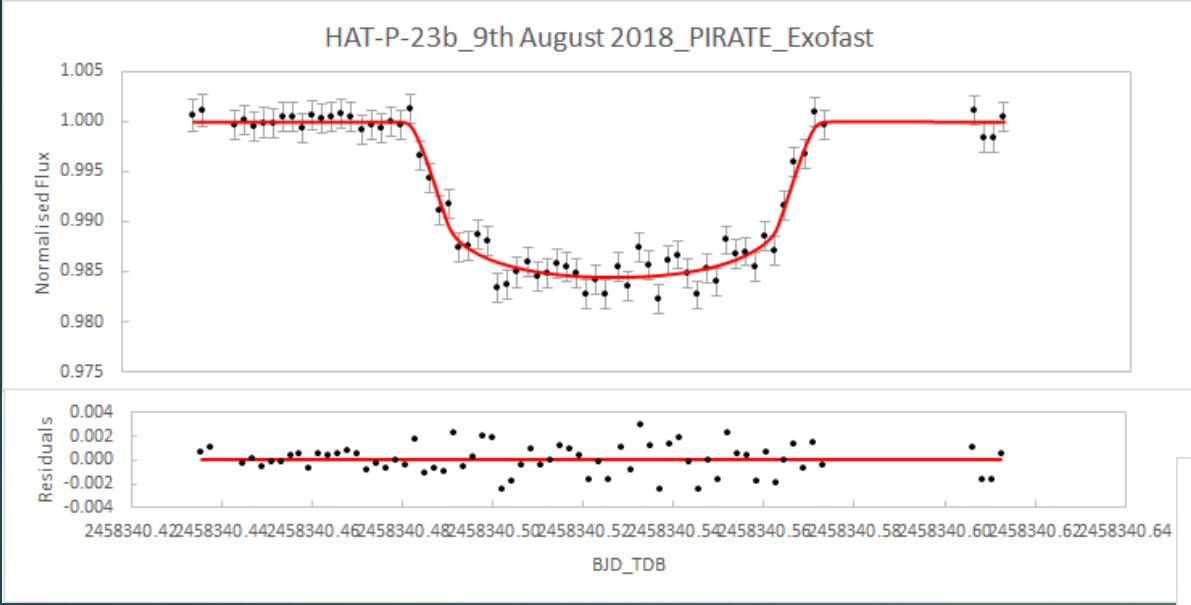
SUPERVISORS: ULRICH KOLB & ANDREW NORTON

PIRATE and COAST Upgrades

- PIRATE upgraded from Baader R,G,B filters to Johnson U, B, V, R, I and a larger 9-slot filter wheel
- COAST camera upgraded from a 1k x 1k to a 3k x 3k chip, and new FLI camera body
- Both cameras now have a GPS timing card tied to the shutter mechanism, giving accurate timing to thousandth of a second
- Model creator freeware automatically creates a pointing model



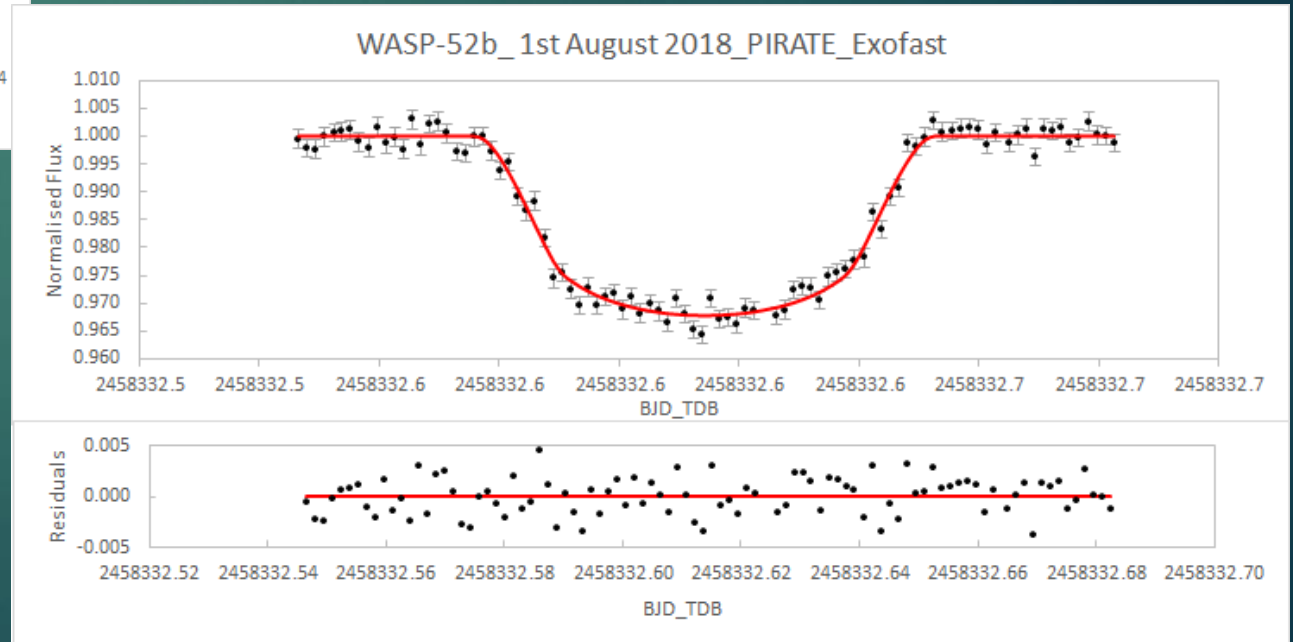
Transits with PIRATE



- ▶ HAT-P 23 is magnitude ~12 in Johnson R filter, here it's dipping as HAT-P-23b transits, causing a ~1.5% dip

All data acquired and reduced by Mark Salisbury at the Open University using PIRATE

- ▶ WASP-52b is magnitude ~12 in Johnson R filter, here dipping as WASP-52b transits, causing a ~3% dip



Gaia Data Obtained by PIRATE

Current Targets

- ▶ Cycling through 25 Gaia targets every few nights.
- ▶ ~10 different targets most nights.
- ▶ 3x Johnson R, V, B each.
- ▶ Data automatically uploaded to the calibration server each day.
- ▶ Microlensing events, CVs, “anything interesting”

Backlog (Back to May 2017)

- ▶ 78 Gaia targets.
- ▶ 400 nights worth of data.
- ▶ >20,000 Gaia target images.
- ▶ Data to be reduced and uploaded in the following weeks.




Milky Way over PIRATE and COAST - Nayra Rodriguez IAC

Automated Pipeline



Gaia17bjw

Details Follow-up



TNS ID
SN2017ein

RA - DEC
178.22188 44.1239
11.52.53.25 44.07.2

Galactic coords.
153.84647 69.32393

Alerting date
2017-05-27 15:38:50

Julian date
2457901.15

Alerting magnitude
16.90

Historic magnitude
None

Historic StdDev
None

Class
SN Ic

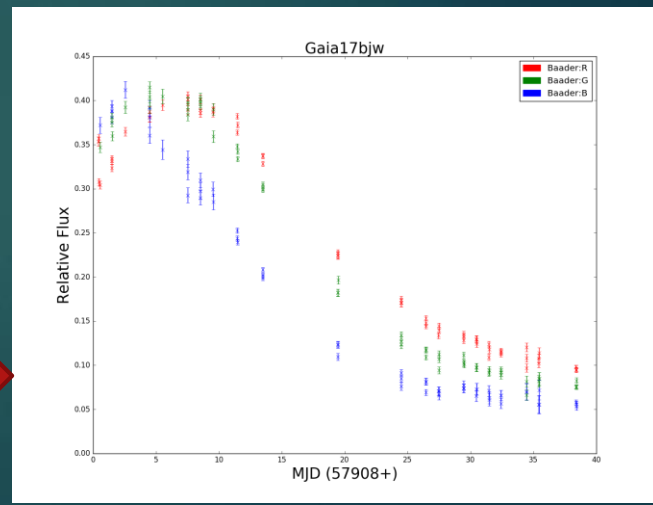
Publication date
May 29, 2017, 4:56 p.m.

Other surveys detections
None

Comments
Confirmed SN Ic, aka SN 2017ein, in galaxy NGC 3938

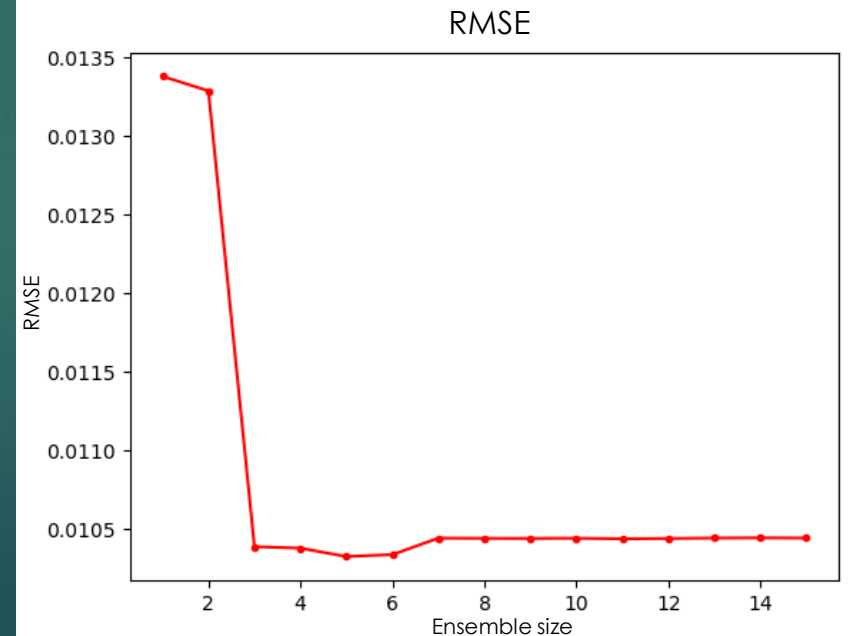
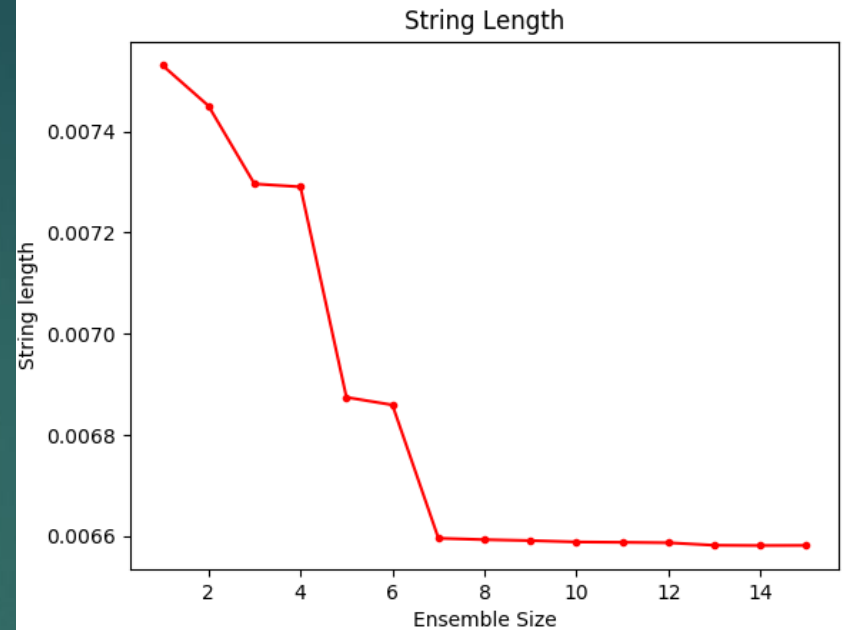
ATels
10434, 10481, 10485

Welcome to the Cambridge Photometry Calibration Server (CPCS)

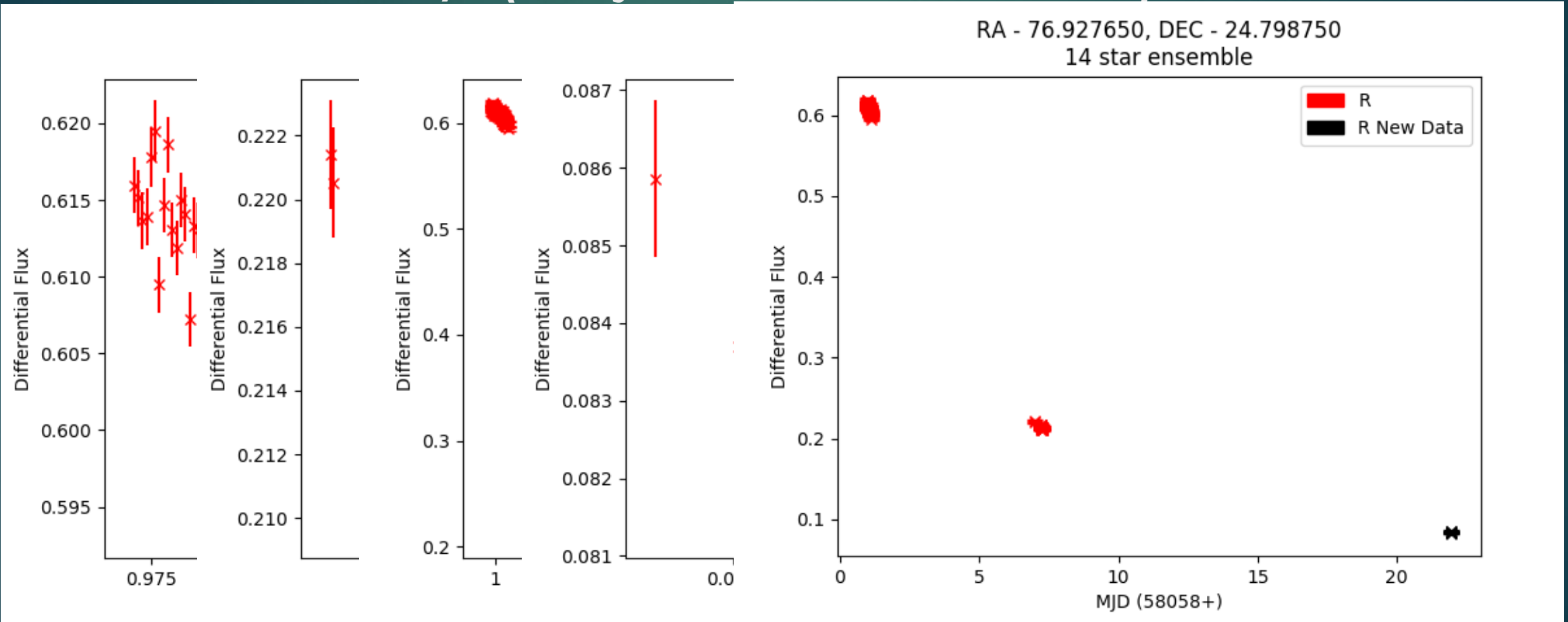


Ensemble Photometry

- All possible reference stars are paired off
- The light curve for the night for each of those pairings is made, and the RMS calculated
- The stars which appear most frequently in the lowest 20% of RMS are chosen as reference stars.
- The stars are added to an ensemble one by one, and the string length of the target and ensemble light curve is calculated
- The ensemble with the lowest string length is chosen as the final light curve



Building up a Long-Term Photometry (Kojima microlens)

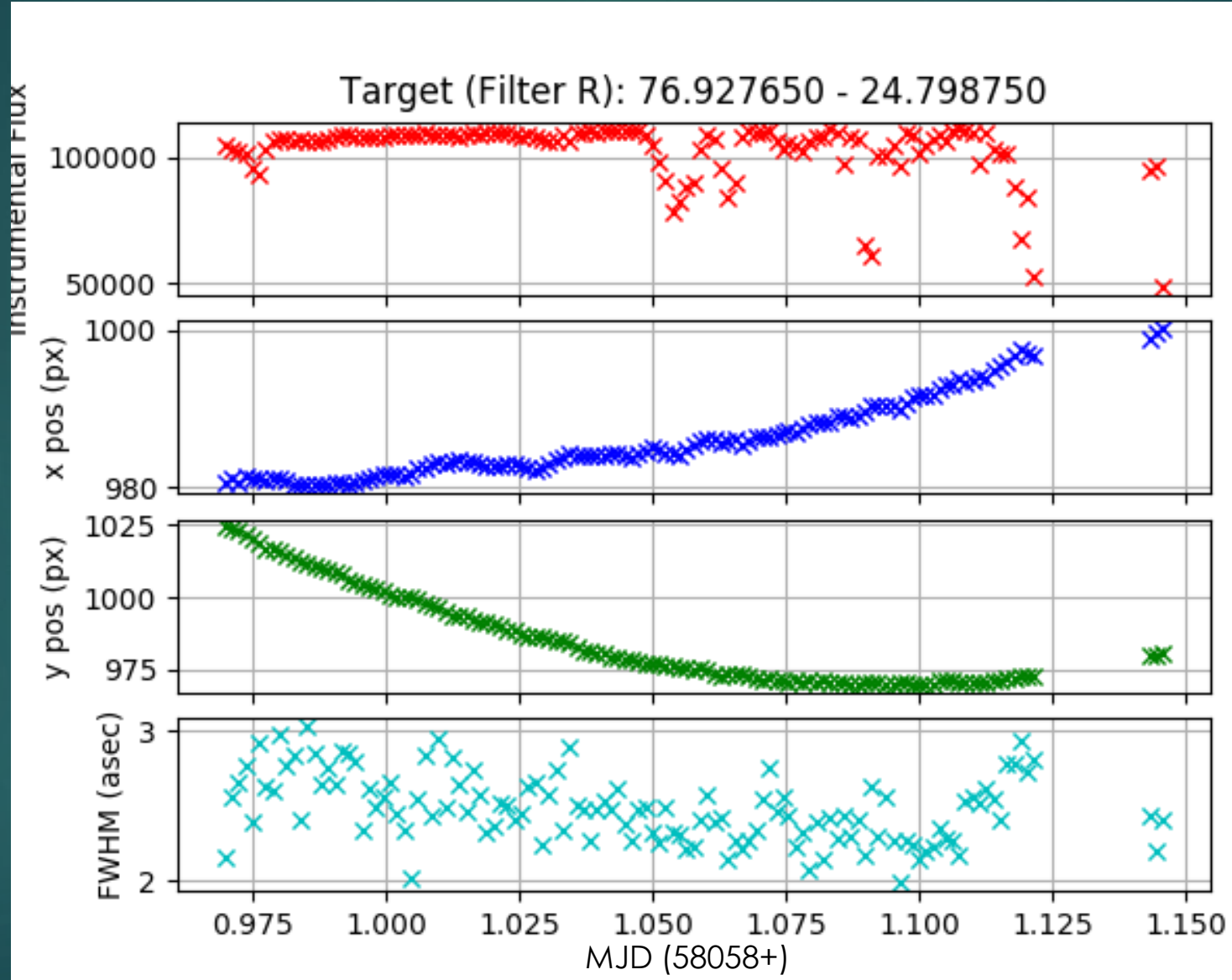


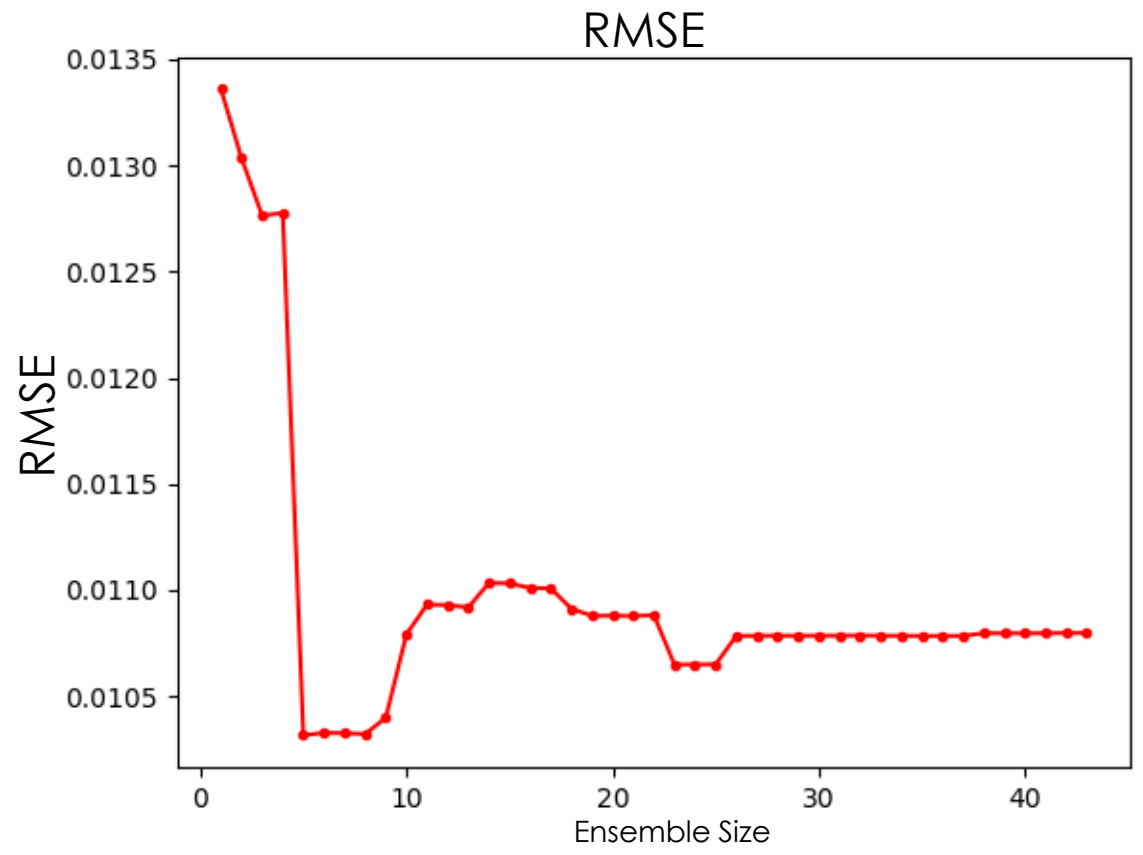
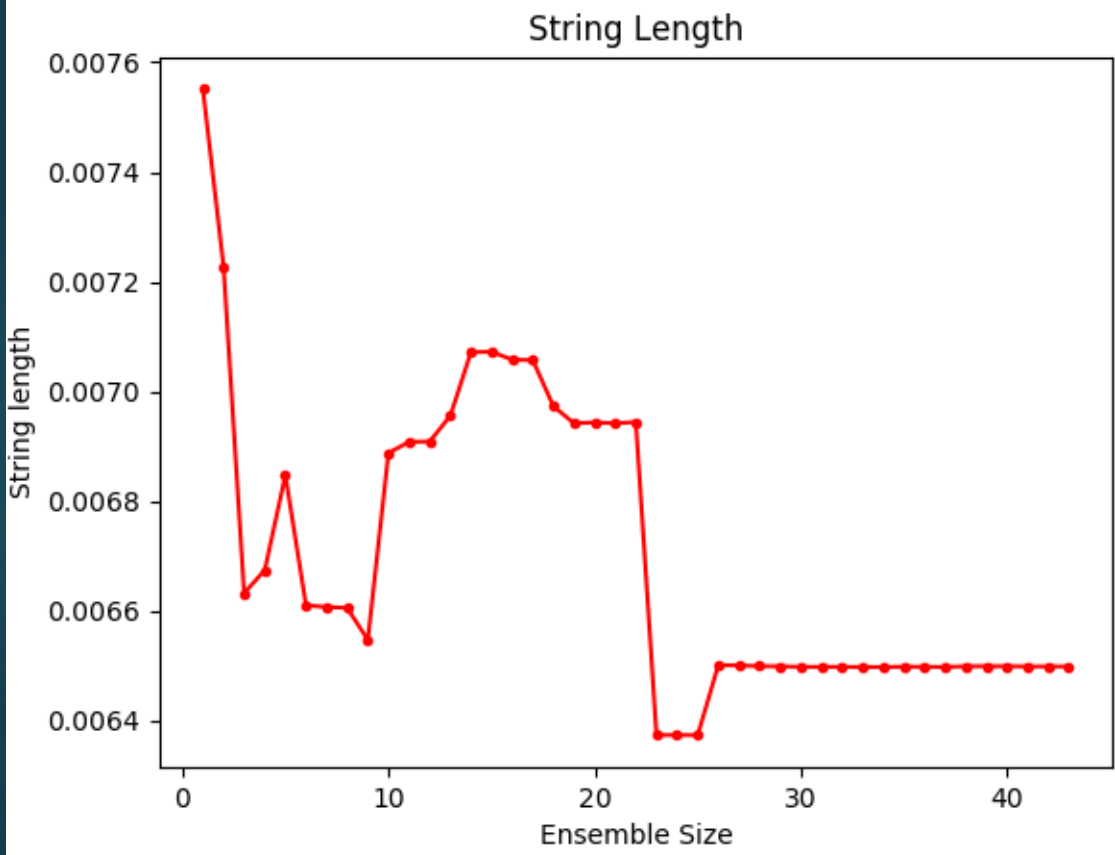
Gaia Alert Light Curves

Summary

- ▶ PIRATE collecting lots of Gaia Alerts data
- ▶ Automation, automation, automation
- ▶ Working through a data backlog
- ▶ Plotting our own light curves using ensemble photometry

- ▶ Need to clear backlog
- ▶ Need become better at removing “old” gaia targets from the schedule
- ▶ Need new targets to observe





- ▶ Gaia17dcb
- ▶ Gaia17ctl
- ▶ Gaia18atk
- ▶ Gaia18cib
- ▶ Gaia18chm
- ▶ Gaia17dce
- ▶ Gaia17cxa
- ▶ Gaia18cjk
- ▶ Gaia18beg
- ▶ Gaia17ddp
- ▶ Gaia18ajz
- ▶ Gaia18akt
- ▶ Gaia18ajt
- ▶ Gaia18apf
- ▶ Gaia18chq
- ▶ Gaia18arn
- ▶ Gaia18cik
- ▶ Gaia18axf
- ▶ Gaia18axl
- ▶ Gaia18bcb
- ▶ Gaia18clv
- ▶ Gaia18avw
- ▶ Gaia18aqa
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- ▶ Gaia17ddi

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- ▶ Gaia17biu
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- ▶ Gaia17bhs
- ▶ Gaia17bie
- ▶ Gaia17biq
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- ▶ Gaia17bic
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- ▶ Gaia17bht
- ▶ Gaia17bjo
- ▶ Gaia17bhq
- ▶ Gaia17bjy
- ▶ Gaia17bts
- ▶ Gaia17bre
- ▶ Gaia17brr
- ▶ Gaia17bsd
- ▶ Gaia17bsu
- ▶ Gaia17bqe
- ▶ Gaia17bqq
- ▶ Gaia17bse
- ▶ Gaia17bsh
- ▶ Gaia17bsr
- ▶ Gaia17btl
- ▶ Gaia17bpu
- ▶ Gaia17bqf
- ▶ Gaia17bql
- ▶ Gaia17bpy
- ▶ Gaia17bpp
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- ▶ Gaia17chf
- ▶ Gaia17bnz
- ▶ Gaia17byb
- ▶ Gaia17bxh
- ▶ Gaia17cff
- ▶ Gaia17cmd
- ▶ Gaia17bol
- ▶ Gaia17cpa
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