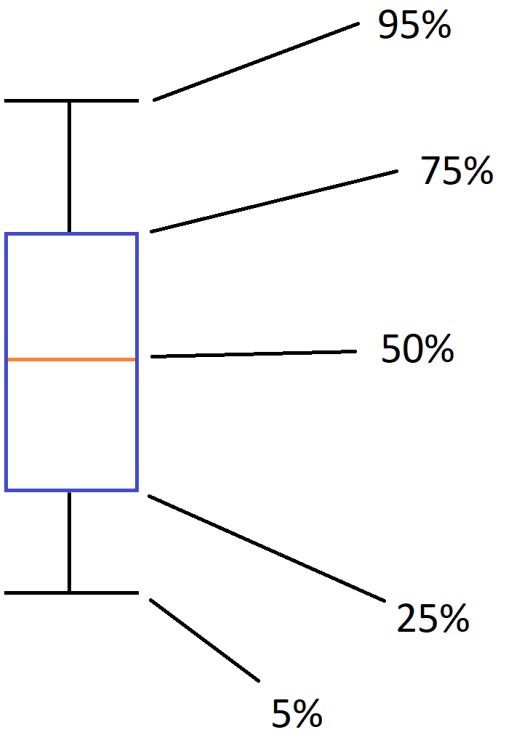
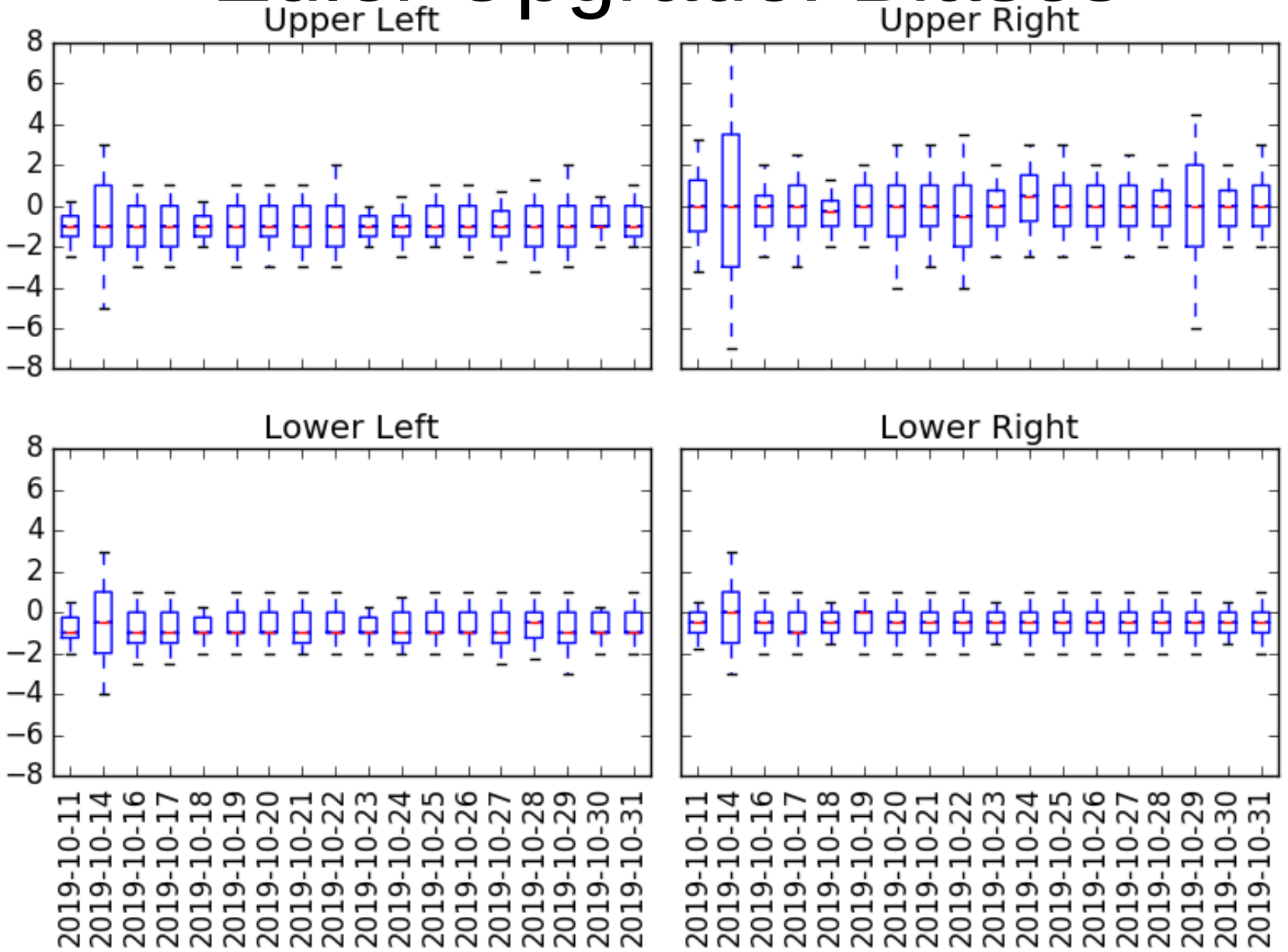
Euler Upgrade: Biases + Flats

- Made box plots of *master* biases and flats for 2 months:
  - Oct 2019 and Jan 2020
  - The Jan biases look less consistent than Oct
  - Flats are similar in stats but different in structure
  - The photometry looks better.
- Box plot guide →
  - Data percentiles



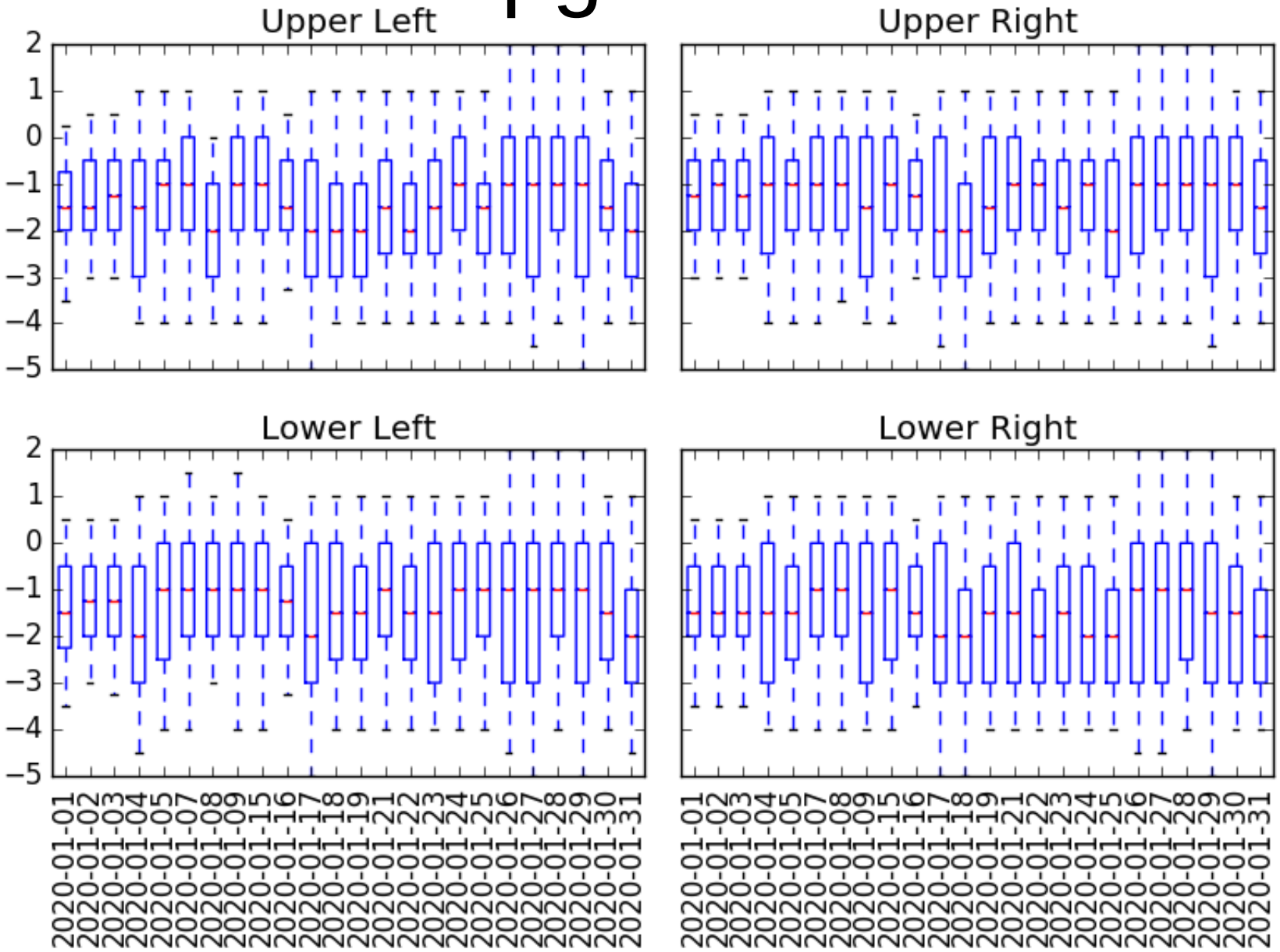
Euler Upgrade: Biases



Bias: October 2019

- Medians close to 0 consistently
- Lower quadrants more consistent than upper
- Upper left shows most variation

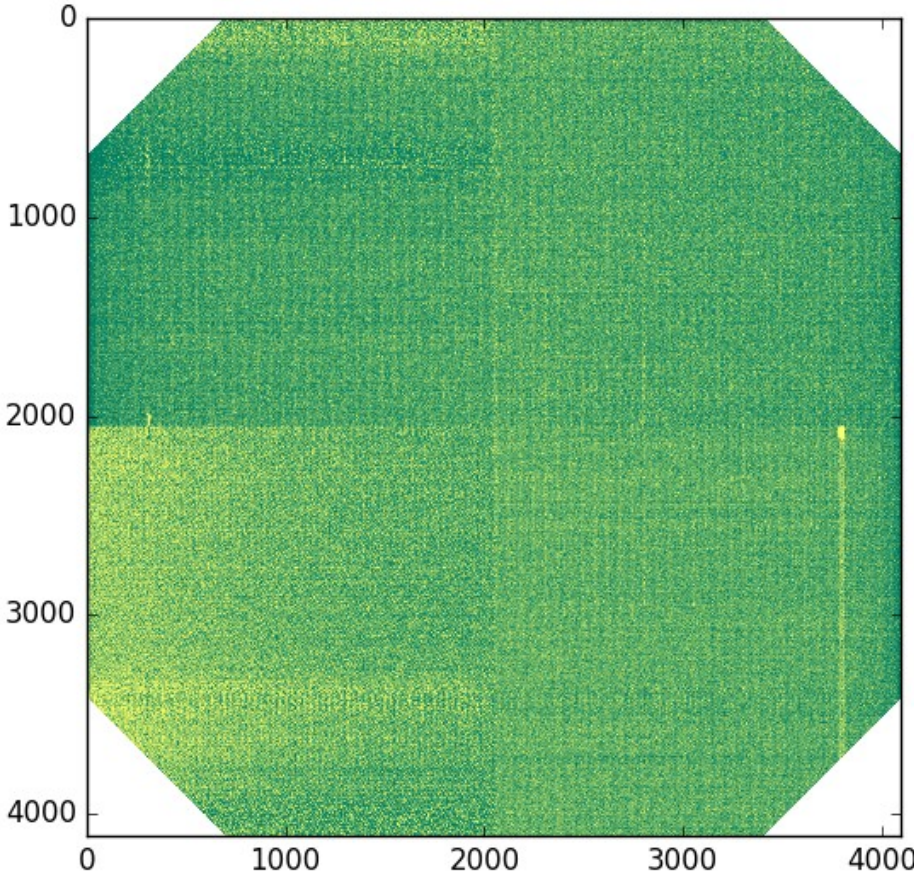
Euler Upgrade: Biases



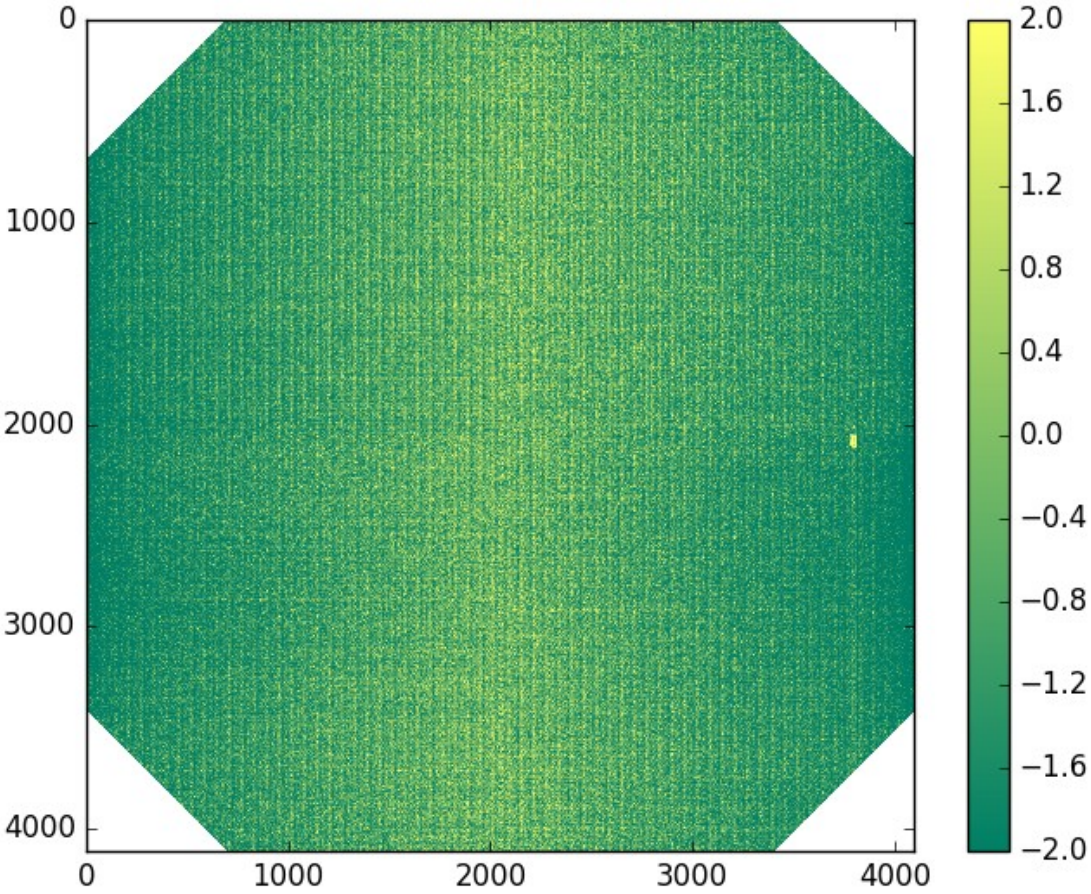
Bias: January 2020

- Medians weakly negative consistently
- Medians show more variability
- All quadrants more consistent than before upgrade
- 5% to 95% range similar to October 2019
- 25% to 75% range larger than October 2019

Euler Upgrade: Biases



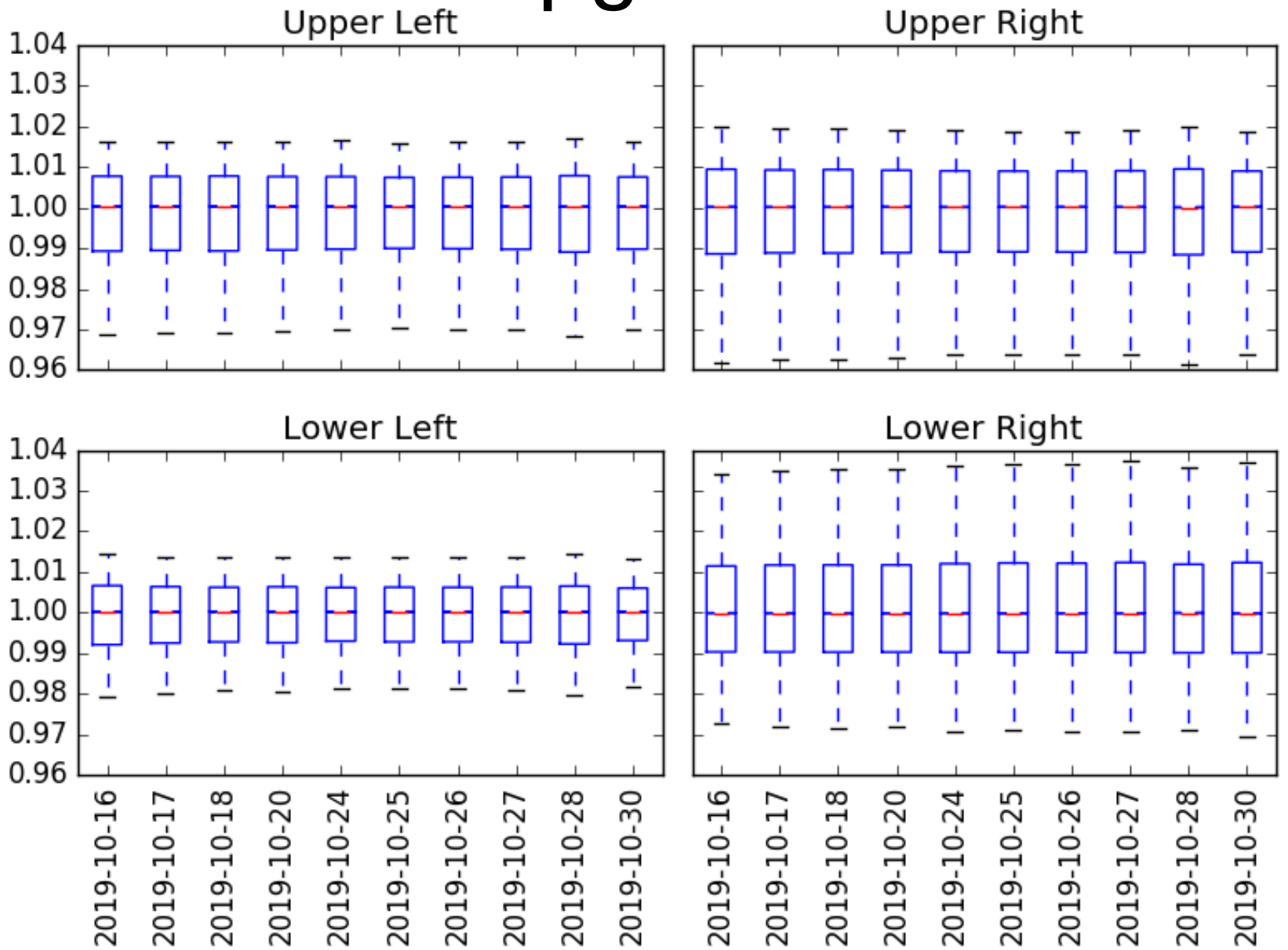
Bias: October 2019



Bias: January 2020

Exact structures are somewhat variable
Pattern visible in January biases is more obvious, not new

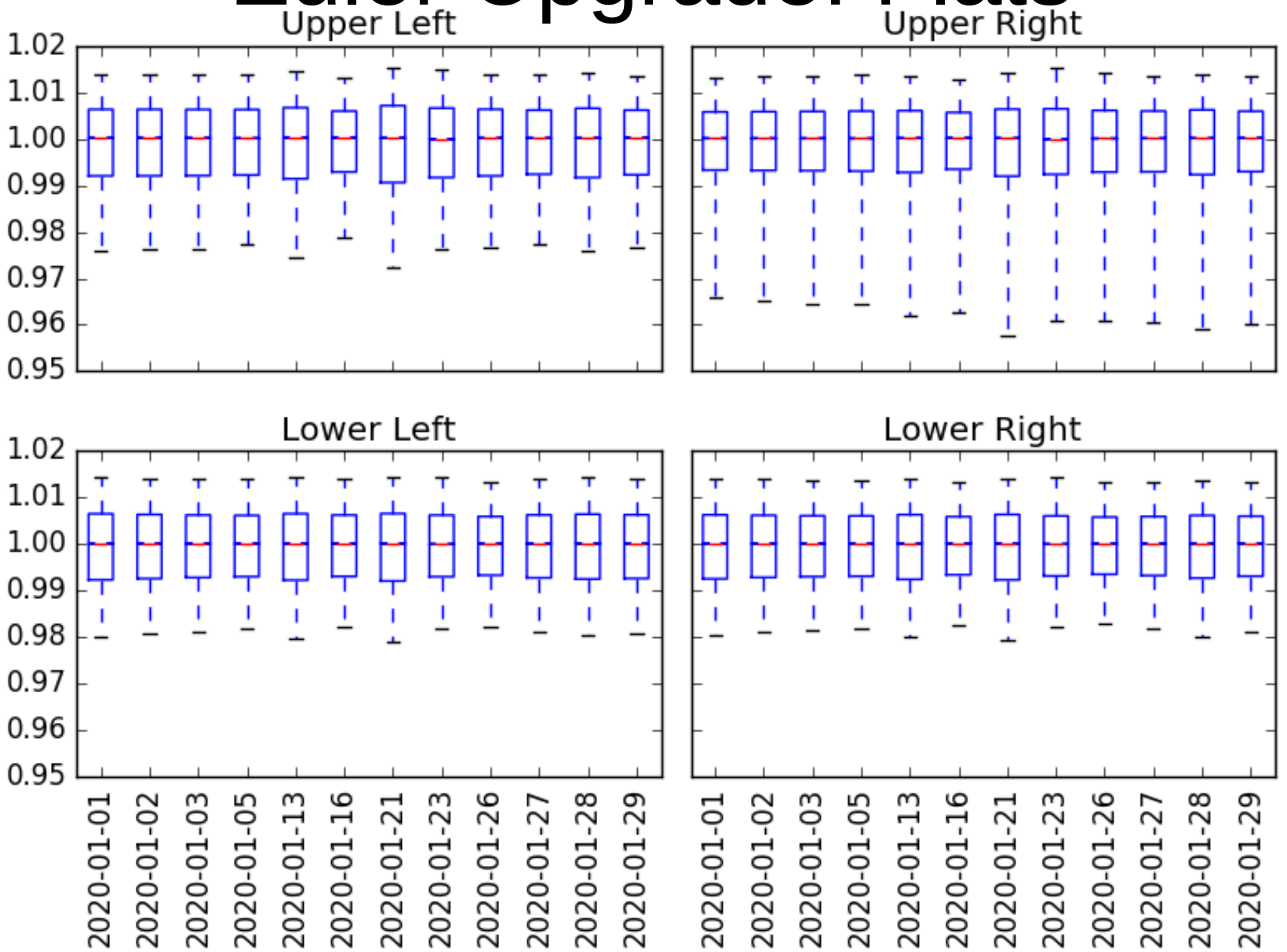
Euler Upgrade: Flats



IC flats: October 2019
25% to 75% interval between 0.99 and 1.01
Consistent medians

5% to 95% intervals consistent
5% to 95% intervals wider for right quadrants

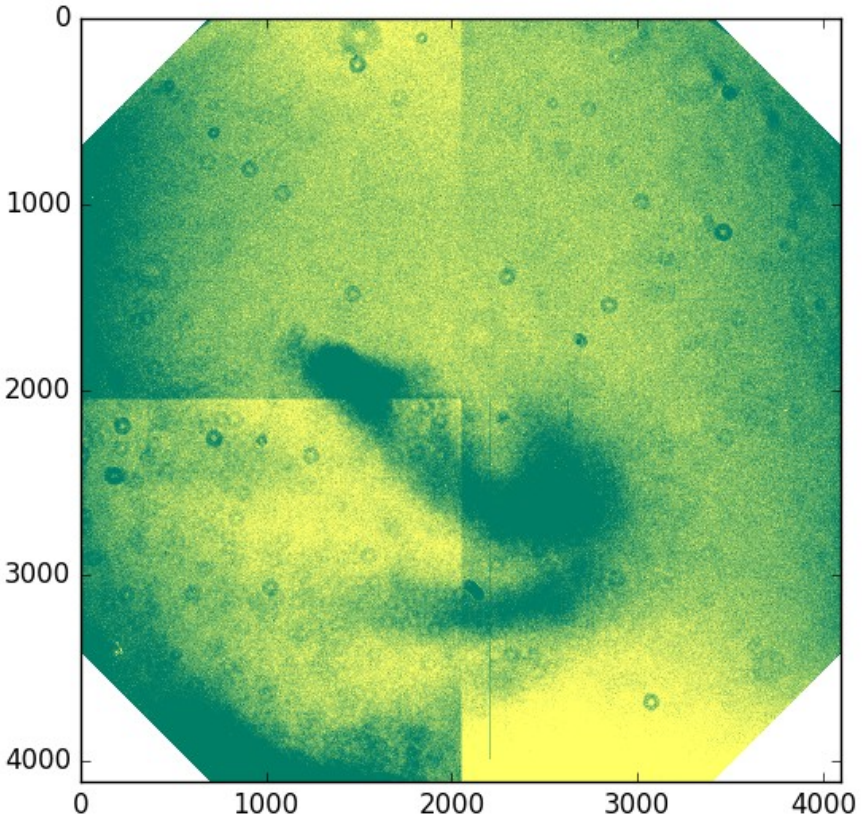
Euler Upgrade: Flats



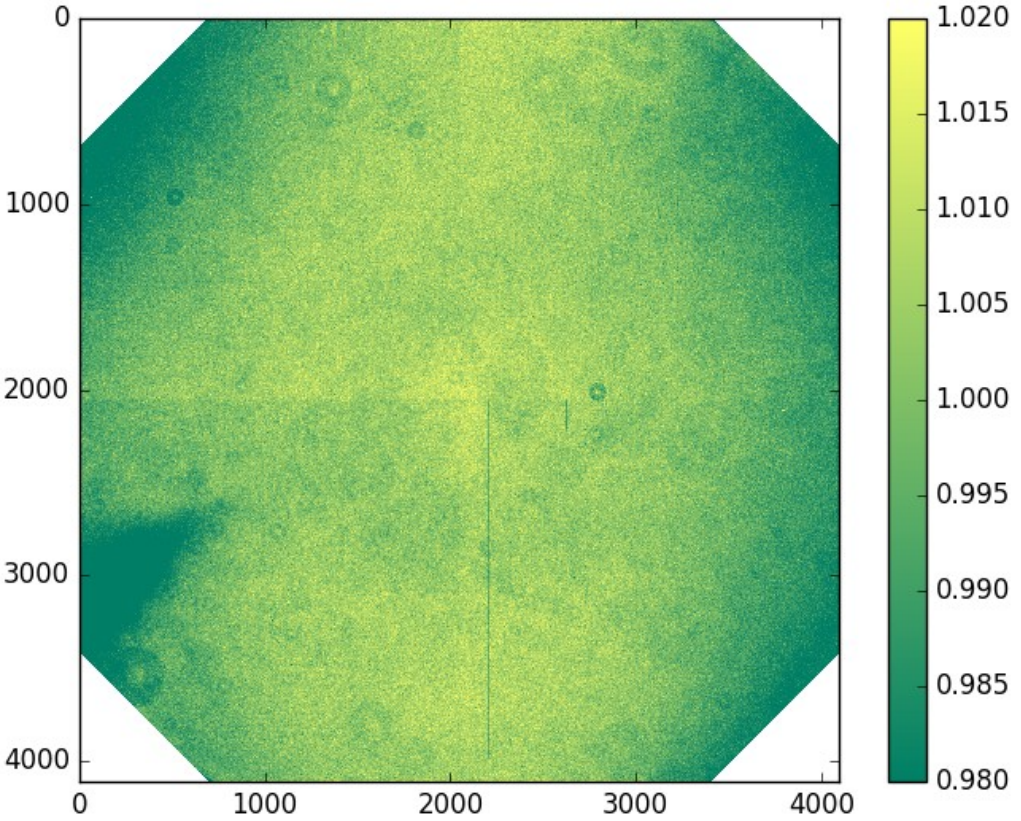
IC flats: January 2020
25% to 75% interval slightly smaller than 2019
Consistent medians

5% to 95% intervals consistent with each other and 2019
5% intervals wider for upper right only

Euler Upgrade: Flats



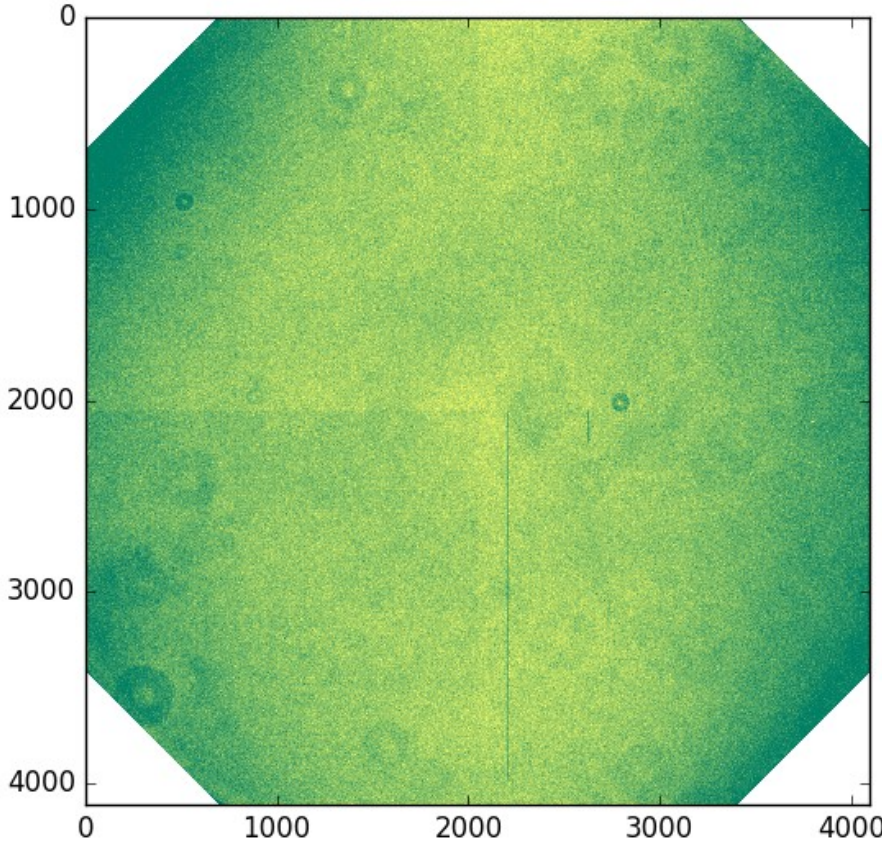
IC flats: October 2019



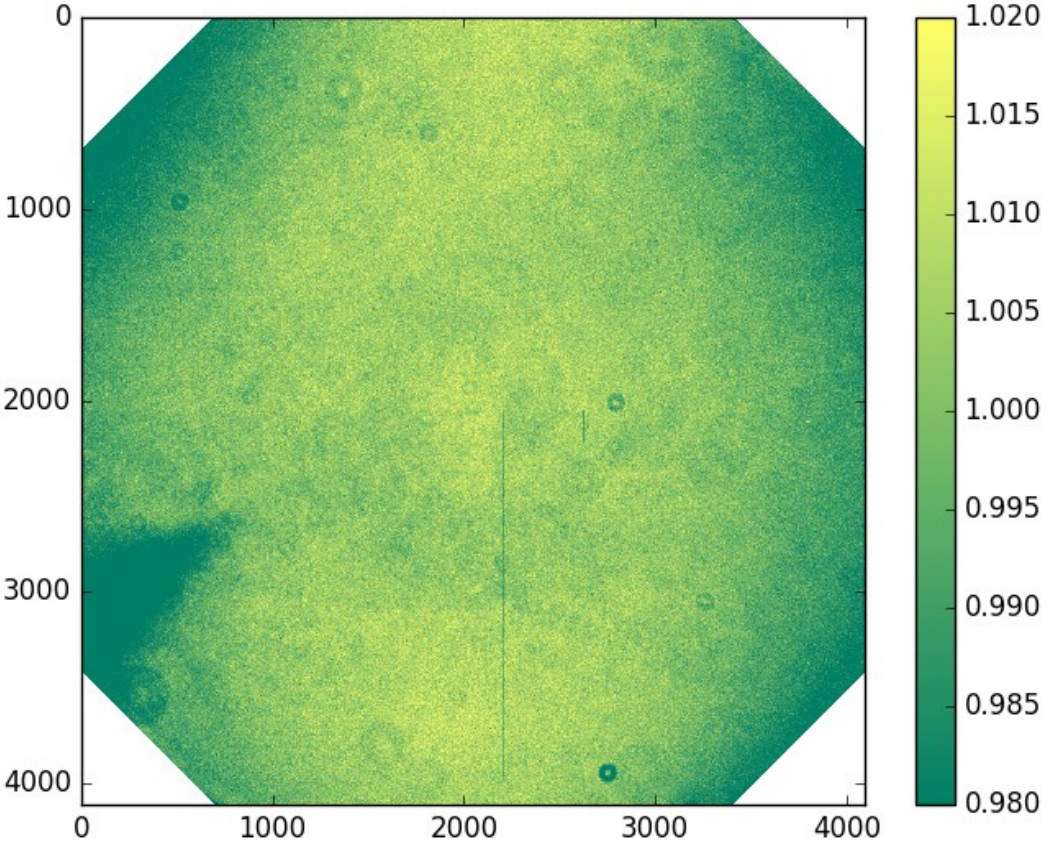
IC flats: January 2020

Behaviours consistent across filters and within months
January flat structure is nicer than former

Euler Upgrade: Flats



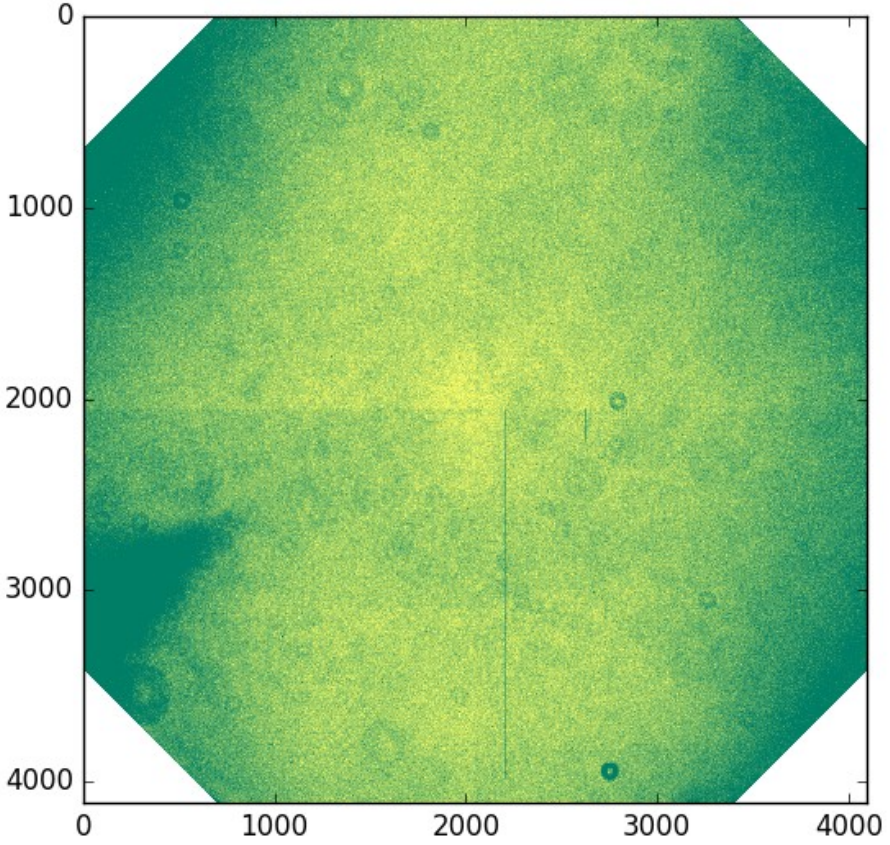
November 2019



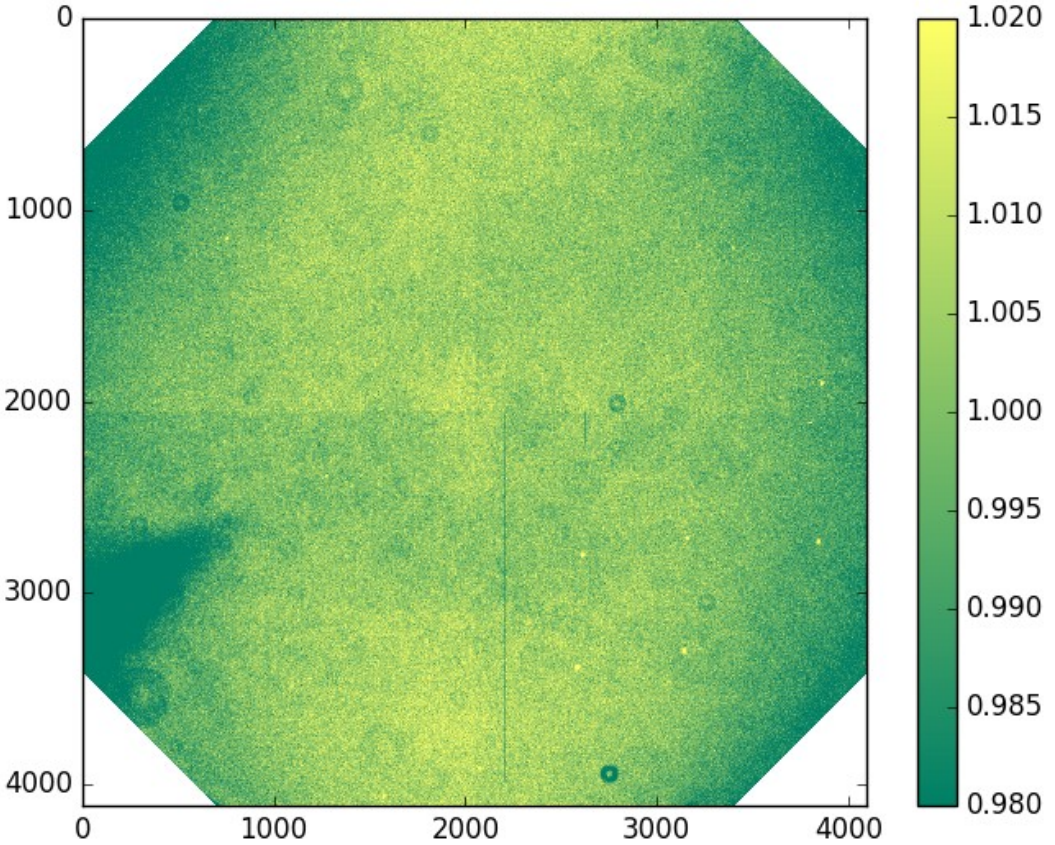
End January 2020

Most of the odd features are gone!
New odd feature has been there since upgrade and is growing

Euler Upgrade: Flats



Shutter almost visible

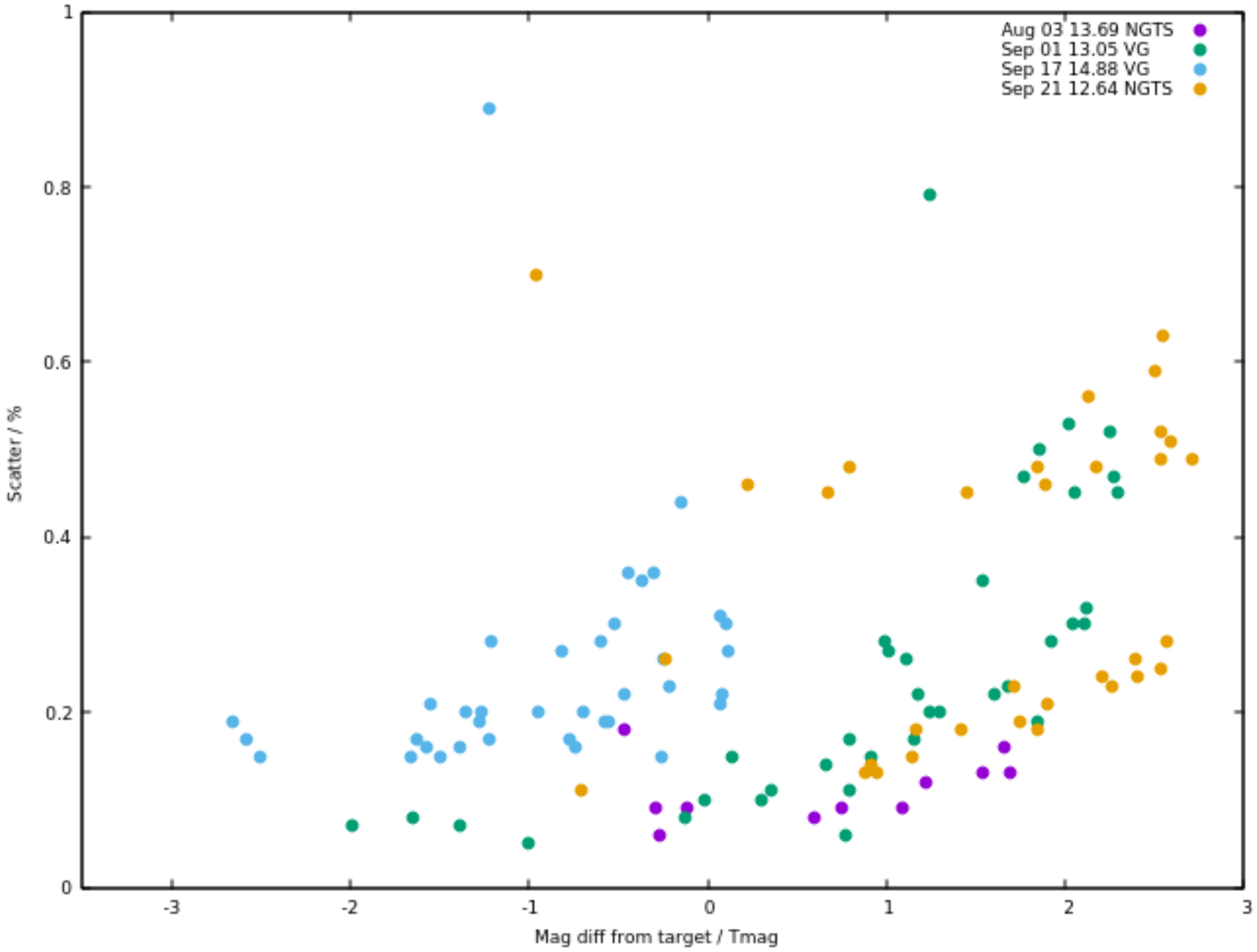


Stars in bottom right
(Really Upper Right quadrant)

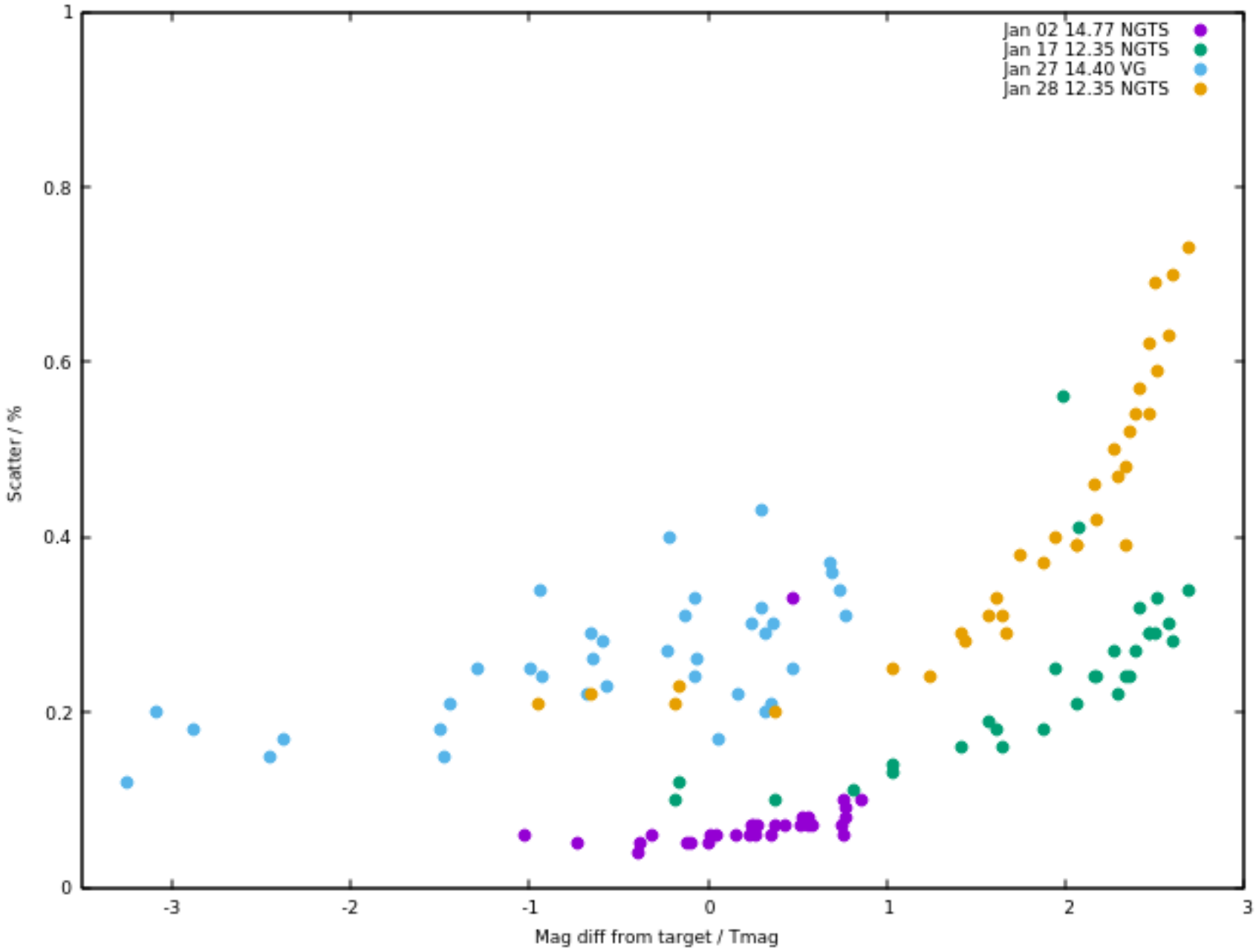
Creation procedure could be modified; stars and shutter sometimes visible.

Euler Upgrade: Photometry

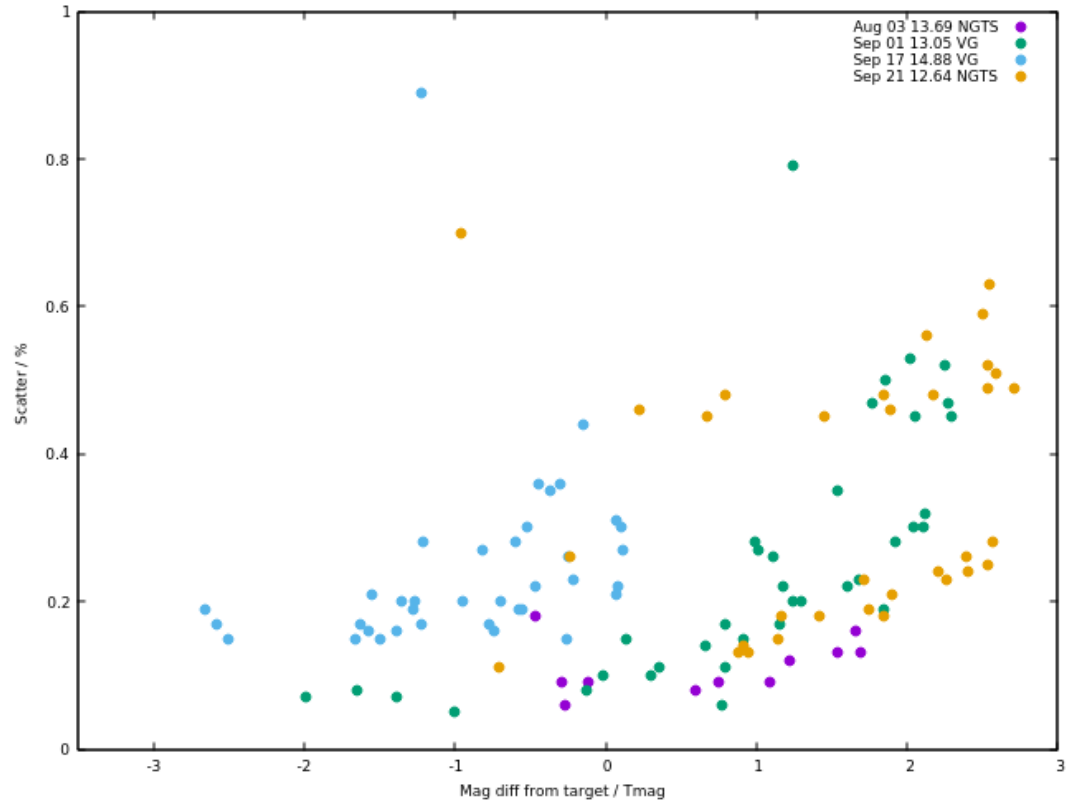
- Aim: compare photometic precision of Eulercam before and after the upgrade
- Method: for several fields pre- and post-upgrade
  - Use automated pipeline to apply corrections and extract photometry for target and ~50 brightest comparisons
  - Determine aperture and comparison star combination that gets the best photometry for the target
  - Apply same combination to the ~50 comparison stars.
  - Compute scatter and plot.

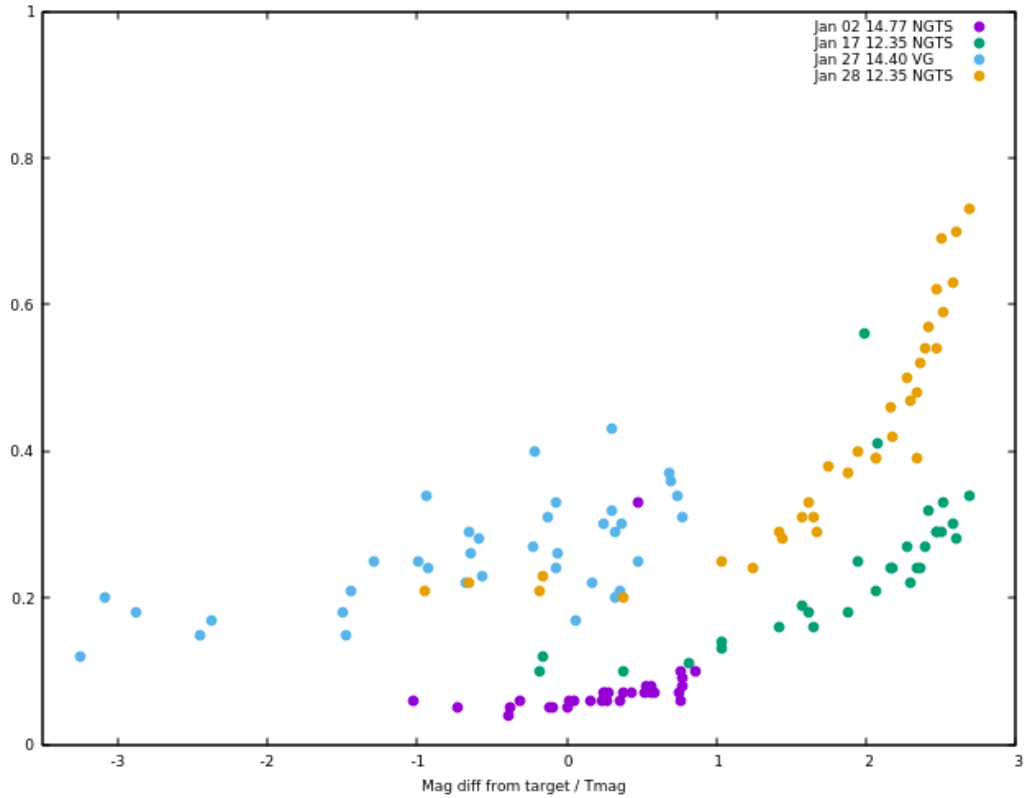


Photometry before upgrade



Photometry after upgrade





- Colours do not denote the same fields
- Much clearer trends in new data
  - Likely because noise in some quadrants reduced
  - Flat field improvement may also have an effect
- Variability in NGTS filter data corresponds with moon phase.
- Precision is as good as the old best and more consistent.