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Newsletter #77, April 15th 2019

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"News from the front": Engineering Update (Richard Dekany)

Flexure Compensation System Update

An update to the ZTF flexure compensation system was implement by David Hale and Reed Riddle over a several nights beginning on April 2, 2019. The key feature is a change to how out-of-focus image calibration files are created, replacing an earlier polynomial fit across each focuser chip to an 8x8 sampled grid which more accurately captures the high spatial frequency variations in out-of-focus second moment that arise from vignetting changes across the focuser chip field. This vignetting is cause by both beam walk-off from the telescope primary at the focusers' large off-axis field angles, as well as partial beam vignetting from undersized spectral coating applied to the ZTF-r and ZTF-g filters. The new calibration has been improving delivered image quality (DIQ) for more than a week now. It appears more robust to variations in field-dependent star distributions and, importantly, brings the ZTF-i filter into commensurate good DIQ compared to the other filters.

In addition Richard Walters mined a large volume of focuser+science data to update our open-loop flexure compensation maps that is the 'starting point' of the active focuser loop following any large telescope slew. The new maps are more consistent between spectral bands and, most importantly, have much improved behavior at high airmass, where variability in DIQ across the mosaic due to flexure was most prevalent.

Optimization of the servo loop behavior of the flexure compensation system remains to be performed, but early performance gains from these two improvements have already realized tangible DIQ improvements.

Charge Spillage

Work has resumed on the problem of charge spillage from image area to serial register a hundred or so columns after a saturated star. The fix was thwarted by recurrent poor weather since we needed on sky time to see it, not having any convenient way to produce bright spots in daytime. We are taking a slightly differnt tack since we now know how to get rid of the spillage and but must re-tune the clock levels to avoid the side affect of the fix which is surface trapping for bright stars. This is a little more complicated in ZTF than usual since we use a large positive bias on the clocks during the exposure to pull the electrons towards the wells and thus reduce lateral charge diffusion. Current efforts are to investigate whether the surface trapping is occuring due to the order of events (and slew rates) for the transition from positively

biased clocks to normal levels that is occuring while the shutter is closing, or during the exposure or during readout.

We are looking at using a method for efficiently measuring deferred charge versus signal, that was developed by our grad student Pavan Bilgi (who successfully defended his Ph.D. thesis on charge transport characterization and optimization this week). If anyone is interested in subtle non-linearities in photometry caused by charge trapping, please contact Roger Smith. Right now, we are dealing with charge spillage into the serial register at the not-so-subtle level!

News from working groups

Supernovae and relativistic explosions: "Our last telecon focussed on infant SNe and fast transients. Adam Miller presented an update of the infant-Ia project. His team is preparing papers on different aspects of infant Ia's. Furthermore, Igor Andreoni presented his recent work on probing the fast transient sky at minute timescales with the Deeper-Faster-Wider survey."

AGNs & TDEs: "The ZTFbh SWG is actively monitoring our nearby, bright TDE JaimeLannister (ZTF17aaazdba). Jaime has developed broad Balmer line features… he is still bright (r~15 mag) so we highly encourage folks at a telescopic to take a quick spectrum over the next month as he gradually declines from peak. We have a new higher redshift TDE, Petyr Baelish, and are continuing our hunt for more! Following our SWG motto: "Leave no TDE behind!"

The papers corner:

The AMPEL (and ZTF detection efficiency) paper has now been submitted. The submitted version is available at http://arxiv.org/abs/1904.05922.

Reminders:

- PublicAlerts:There is a link to the alerts archive on the website!
- Please help us keeping track of all the available softwares! A preliminary list is available on the twiki. Let us know if you are building a software which you think could benefit (or be relevant to) a large portion of the collaboration.
- **ZTF general slack channel**: Please join through this link!
- If you want to get access to the **ZTF data** via the IRSA interface, please request data access to the communication coordinators: ztf.communication.coordinators@gmail.com
-**Archive GUI** now ready! The interactive image search, filtering and visualization tool is now ready ().
- The **ZTF Twitter account**is now active! https://twitter.com/ztfsurvey Re-tweet @ztfsurvey!

- To use the **url shortener**(e.g. during telecons, talks, in emails), navigate tohttp://zwicky.tf/shorten (username: ztf password:16chips) and type in the URL you want shortened.
- The **Wiki page** is active! Check it out at http://zwicky.tf/wiki. To request access, please email us at ZTF.communication.coordinators@gmail.com

"Shoot for the moon. Even if you miss, you'll land among the stars" (Oscar Wilde)

Have a great and productive week!

Thomas and Maayane