

SEPTEMBER 2017

MAST NEWSLETTER

THE LATEST UPDATES FROM THBARBARA A. MIKULSKI ARCHIVE FOR SPACE TELESCOPEST

STSCI

HOW POPULAR ARE COMMUNITY-CONTRIBUTED DATA PRODUCTS? AN EXPLORATION OF DOWNLOAD STATISTICS FOR THE K2 MISSION

K2 HIGH-LEVEL SCIENCE PRODUCTS FROM VARIOUS TEAMS HAVE SHOWN TO BE VERY POPULAR DOWNLOADS, EVEN WHEN COMPARED TO MISSION-PRODUCED LIGHT CURVE DATA.

SEPTEMBER 13, 2017



High Level Science Products (HLSPs) are community-contributed data products that complement or supplement a MAST-supported mission. These can include images, spectra, light curves, catalogs, maps, and simulations. They might utilize follow-up observations from other telescopes, or data from MAST missions processed in a unique way. MAST currently hosts more than 120 HLSPs, and the collection is constantly growing. \equiv

The collections of detrended K2 light curves hosted on MAST have proven to be especially popular products. In these datasets, the systematic errors caused by spacecraft pointing drift have been corrected using a number of different techniques. As of this writing, five different teams have provided their detrended K2 light curves and associated data products:



K2SFF, K2VARCAT, POLAR, K2SC, and EVEREST, while several others are in preparation. One question we have had at MAST is how the usage of these data products compares with mission-provided light curves. We found that these HLSPs are downloaded more than the K2 mission products, after accounting for different sizes of the light curve files.

We were also curious if this was the result of a few users downloading lots of these data products, but it turns out there are often more unique IP addresses (i.e., archive users) accessing the K2 HLSP light curves than the mission-produced ones too.

The final statistic we looked at was the total number of files being downloaded (rather than the total size) per month, and once again, the K2 HLSP usage is larger than the mission-produced usage.





While we are not making the individual results public at this time, it also turns out that some of these K2 HLSPs are out-performing the mission-produced light curves by themselves. These datasets provide a very good example of how contributing an HLSP to the MAST repository can increase the impact of your research.

Any questions or comments on these statistics may be directed to archive@stsci.edu. Or, if

you are interested in developing a new HLSP with MAST we would be happy to discuss the possibilities!

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THE NEW CALACS: BIG CHANGES COMING TO ACS DATA

A RECENT UPDATE TO THE CALACS DATA CALIBRATION PIPELINE HAS MADE A NUMBER OF IMPROVEMENTS TO THE HANDLING OF ADVANCED CAMERA FOR SURVEYS DATA. ACS USERS ARE ENCOURAGED TO REPROCESS DATA USING THE NEW UPDATES.

SEPTEMBER 13, 2017



The 2017.2A quick fix saw some major updates to the data calibration pipeline CALACS that will affect all Advanced Camera for Surveys (ACS) data going back to the initial ACS installation. This new version of CALACS (version 9.2.0) contains many improvements to make the data as accurate as possible. Some of the major highlights include:

- A new sink pixel flagging algorithm and new type of reference file that flags weak charge traps in ACS/WFC data (see ACS ISR 2017-01) similar to what WFC3/UVIS is currently performing except that the charge traps are recalculated each anneal for ACS.
- A new pixel-based Charge Transfer Efficiency (CTE) correction for the Wide Field Channel (WFC) detector which now more accurately models CTE losses in WFC (ACS ISR 2017-07 coming soon!). This includes new code to look at each pixel individually as well as a new time-dependent model.
- The ACS team studied all of the hot pixels in WFC dark images to perform a stability analysis, which discovered that almost all hot pixels are stable to within their Poisson

variance and thus could be trusted for most science (see ACS ISR 2017-05). New darks will use Data Quality bit 32 to flag instability of an individual pixel which will be propagated into science data.

• And finally, an enhanced Bias level correction that now correctly calculates the bias level for amplifier B and D subarrays. This new process now uses a reference file to identify and trim the overscan regions.



Dataset jd1y03011 (prop 14398) processed using the new calibrations and without. This is an image of the ACS calibration globular cluster 47Tuc (NGC 104) in filter F606W taken on August 17, 2016.

Progress on reprocessing of ACS data can be found at

https://archive.stsci.edu/hst/processing_status/ and a full change log of the new software can be found in the HSTCAL 1.3.0 release notes. We strongly encourage all users to redownload or re-process their data using new reference files and using err weighting when drizzling. Additional questions may be directed to the STScI Help Desk.

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NEW AND UPDATED HIGH-LEVEL SCIENCE PRODUCTS AVAILABLE FROM MAST

THE MAST TEAM HAS RECENTLY RELEASED A NUMBER OF UPDATED HIGH-LEVEL SCIENCE PRODUCTS ON TOPICS FROM SOLAR SYSTEM TO GALAXY CLUSTER SCIENCE. READ MORE ABOUT THESE PROGRAMS AND HOW TO ACCESS THEIR DATA PRODUCTS FROM MAST.

SEPTEMBER 13, 2017



We are happy to announce there have been a number of recent updates and additions to various High-Level Science Products (HLSPs) hosted on MAST, which are now available to the astronomical community. These include:

- New: K2 Extracted Light Curves (K2SFF) K2 Campaign 11 detrended light curves from Vanderburg et al. are now available.
- **Update:** Grism Lens-Amplified Survey from Space (GLASS) The GLASS team has added HST ACS optical data for 4 galaxy clusters, complementing WFC3 NIR data. Spectra, catalogs, and redshifts are available.
- Update: MUSCLES Treasury Survey The Measurements of the UV Spectral Characteristics of Low Mass Exoplanetary Systems (MUSCLES) team added a highresolution synthetic spectrum of GJ 832 (M2 V) ranging from X-rays to the infrared (Fontenla et al. 2016).
- **Update:** Outer Planet Atmospheres Legacy (OPAL) The OPAL team released Cycle 24 data of Jupiter (8 filters, 2 rotations).

Questions about these or other high-level science products can be sent toarchive@stsci.edu. Interested in submitting your own HLSP to MAST? Read more about the process here and contact us to discuss development.



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NEW AND UPDATED HIGH-LEVEL SCIENCE PRODUCTS AVAILABLE FROM MAST

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ABOUT

This newsletter is a MAST publication produced by Jonathan Hargis, Peter Forshay, and Randy Thompson, on behalf of the entire MAST staff, who welcome your comments and suggestions.

The Mikulski Archive for Space Telescopes (MAST) is a NASA funded project to support and provide to the astronomical community a variety of astronomical data archives, with the primary focus on scientifically related data sets in the optical, ultraviolet, and near-infrared parts of the spectrum. MAST is located at the Space Telescope Science Institute (STScI).

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