

# Alice Data Review

## New Horizons KEM 1 v6.0 Levels 2 and 3

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John Noonan

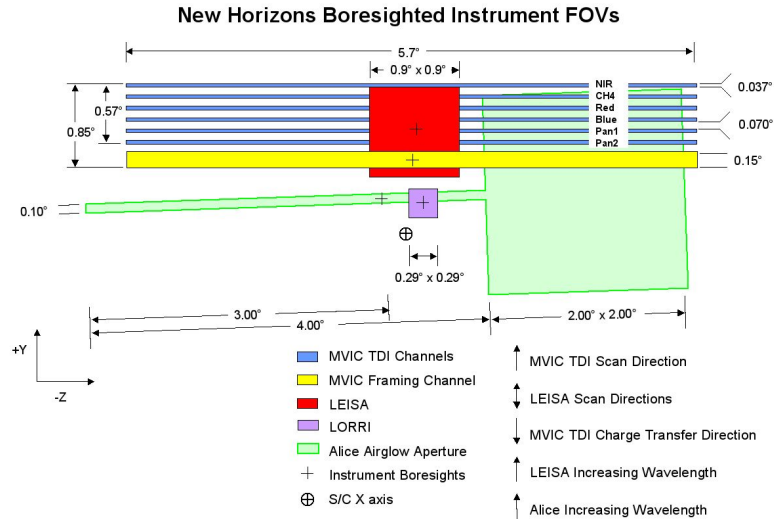
October 19, 2022

## Overview: KEM1 v6.0

- Review of nh\_a\_alice\_2\_KEM1\_v6.0 and nh\_a\_alice\_3\_KEM1\_v6.0
  - Previously reviewed nh\_x\_alice\_2\_KEM1\_v1.0, nh\_x\_alice\_3\_KEM1\_v1.0, nh\_a\_alice\_2\_KEM1\_v2.0, nh\_a\_alice\_3\_KEM1\_v2.0, nh\_a\_alice\_2\_KEM1\_v3.0, nh\_a\_alice\_3\_KEM1\_v3.0, nh\_a\_alice\_2\_KEM1\_v4.0, nh\_a\_alice\_3\_KEM1\_v4.0, nh\_a\_alice\_2\_KEM1\_v5.0, nh\_a\_alice\_3\_KEM1\_v5.0,
  - New submission includes data through 05-01-2022 (S/C Time)
    - 1043 total observations
    - V5.0 had 738 observations (see index.cat)
    - 305 new files include new mode (270 from 12/4/2019, 35 since 5/21/2021)
1. **No major issues preventing database from use and data look good**
  2. **12/4/2019 data (270 files) needs Target Name keyword updated**

# Brief P-Alice Instrument Overview

- P-Alice is an ultraviolet spectrograph sensitive from 520 to 1870 Angstroms
- A “lollipop” shaped slit is used (wide on top, narrow on bottom)
- Detector has 1024 columns in the spectral dimension, 32 rows in the spatial dimension.



Boresight Locations			
	Rot abt Y (deg)	Rot abt Z (deg)	Rot abt X (deg)
S/C	0.00	0.00	
Ralph/MVIC Frame	-0.07	-0.74	
Ralph/MVIC P2	-0.08	-0.92	
Ralph/MVIC NIR	-0.08	-1.50	
Ralph/LEISA	-0.11	-1.04	
LORRI	-0.17	-0.32	
Alice Airglow	0.21	-0.37	2.00

Axes are S/C coordinates, as projected onto sky.  
 -X is into page, +X is out of page.  
 During MVIC TDI and LEISA scans, s/c rotates about the -Z axis.  
 Diagram is to scale. Based on pre-flight and in-flight alignments specified in nh\_v110.tf.

H. Throop/SwRI, 21-Sep-2007

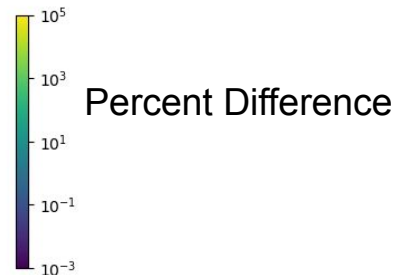
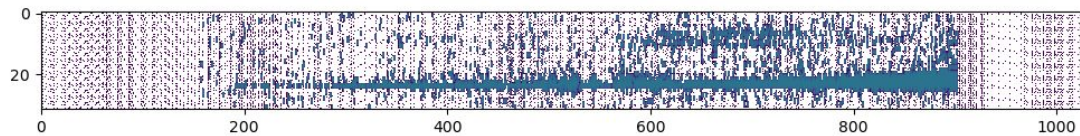
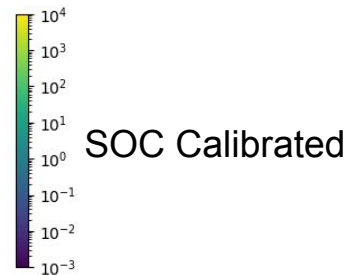
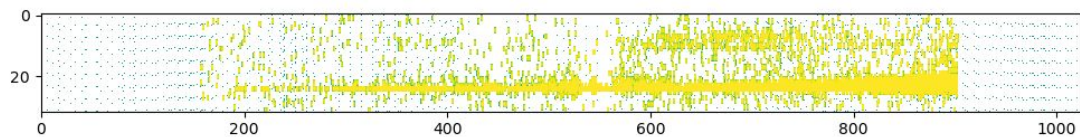
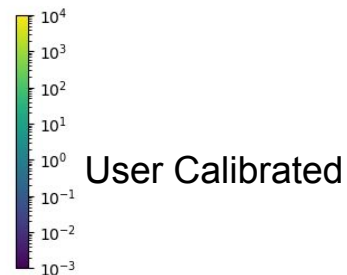
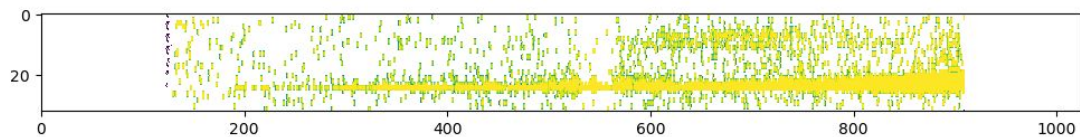
# Data Review: Alice KEM1 v6.0

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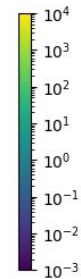
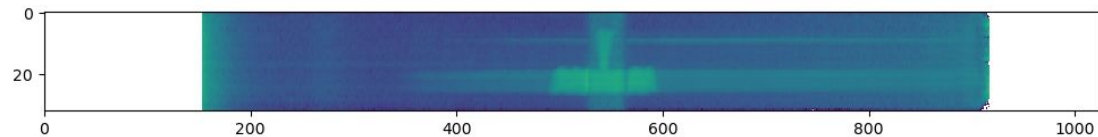
# Usability

- All .fits files accessed using Python and astropy.io.fits
  - All eng files calibrated according to ICD
  - All sci files accessed, both data and headers
  - Log file with machine readability available
  - PNGs with both user-calibrated, science files, and differences available on request
  - Python code available as well
- All .lbl files checked with Python script for machine readability
  - Log available upon request
- Folders checked against V5 with BeyondCompare software
- Select files checked in NASAView/DS9 to ensure \_eng.fits files matched \_sci.fits files
  -

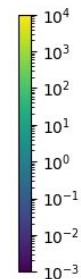
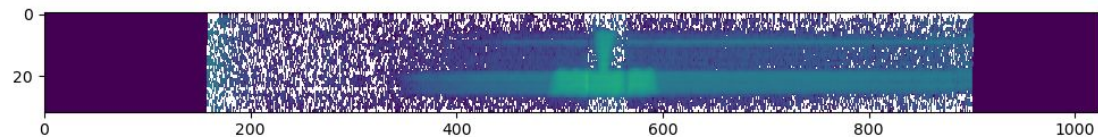
# Backfilling 12/04/2019 data (“N/A” Target): ali\_049527618\_0x4b2\_sci



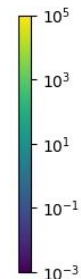
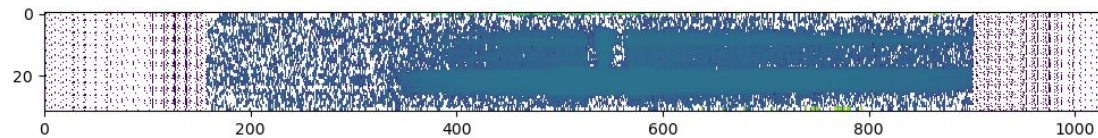
# Example Difference Image: ali\_049527618\_0x4b2\_sci



User Calibrated

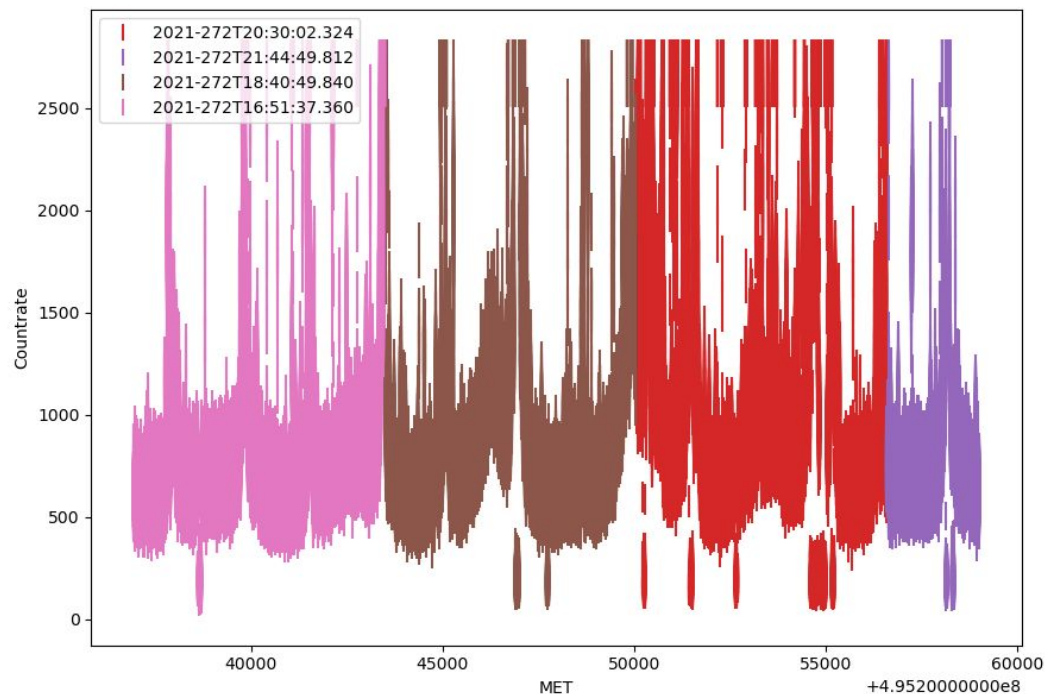


SOC Calibrated



Percent Difference

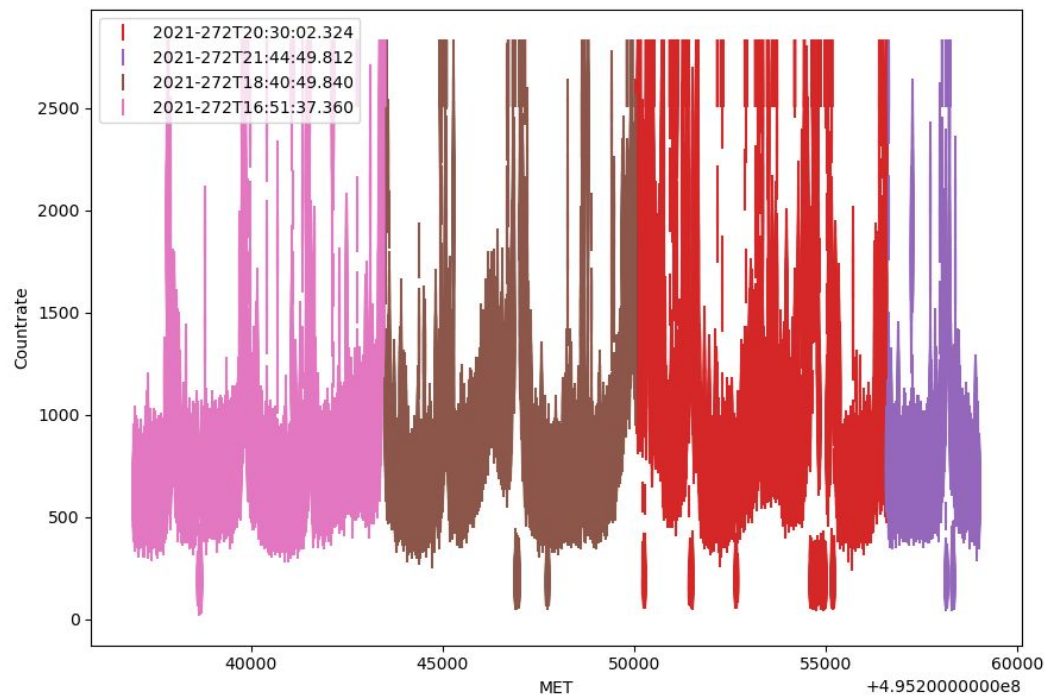
# Lyman Alpha Countrate



- Four extended Ly-A High Cadence Countrate (HCCR) observations while scanning in RA and DEC.
- Need detailed pointing files to recreate high level data product maps, but in principle straightforward to do.



# Lyman Alpha Countrate



- New HCCR mode described in SOC Instrument ICD in Alice section
- New “DarkSky” Target added to dataset.cat

# Major Issues

1. None

# Minor Issues

1. 12/4/2019 data should have Target\_Name as “Sun”, given header keyword NEWHORIZONS:OBSERVATION\_DESC = “APPROACH SOLAR UNOCCULTED SOCC OBSERVATION PIXELLIST”