

# Alice Data Review

## New Horizons KEM 1 v4.0

---

John Noonan

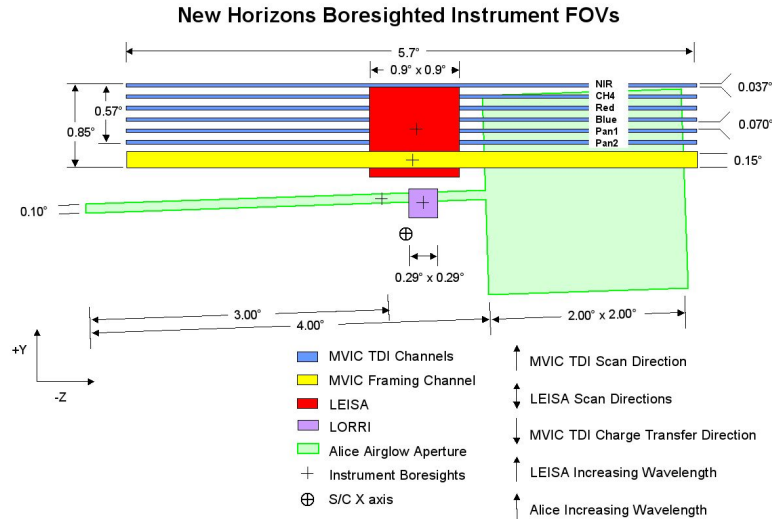
December 4, 2020

# Overview

- Review of nh\_a\_alice\_2\_KEM1\_v4.0 and nh\_a\_alice\_3\_KEM1\_v4.0
  - 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
  - New submission includes data through 08-31-2019, 22:46 UTC (S/C Time)
    - 726 total eng/sci.fits files in each
    - V3.0 had 494 FITS files
    - New files are Alice pointing/flux verification, IPM measurements
1. **No major issues preventing database from use and data look good**
  2. **One minor issue**

# 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

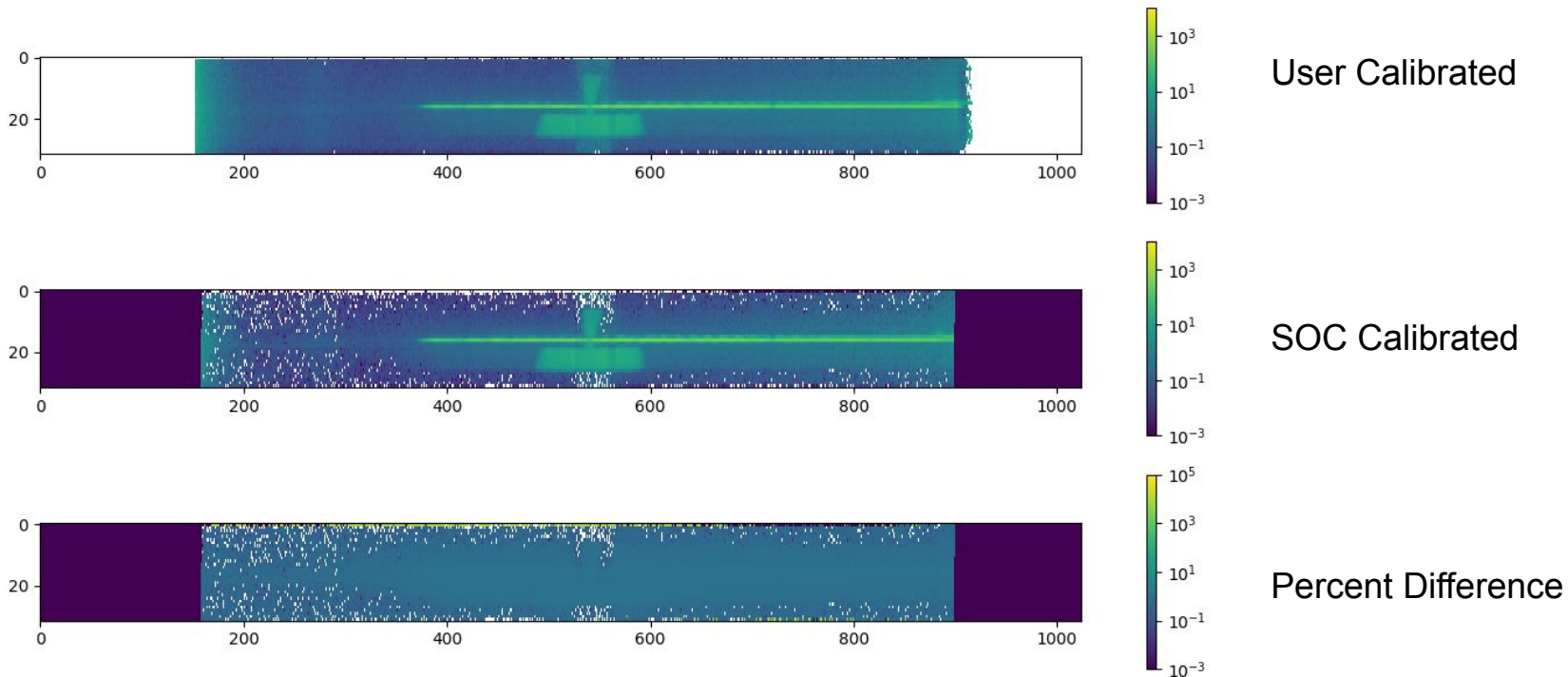
# Data Review

---

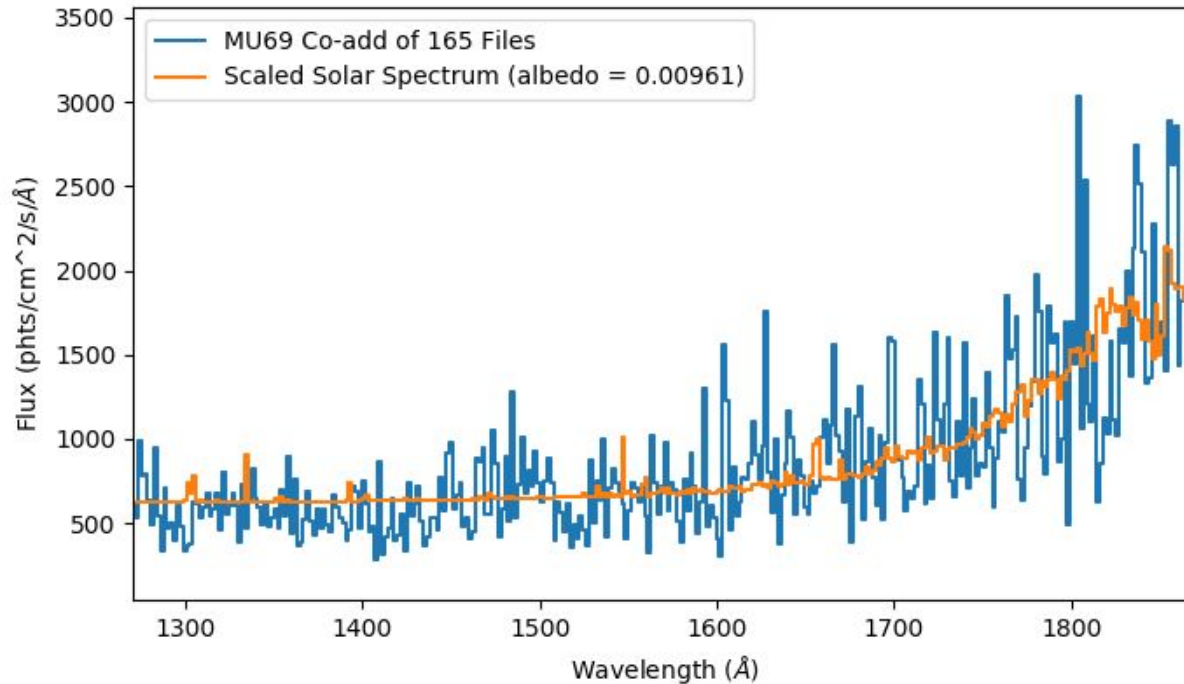
# Usability

- 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
- Select files checked in NASAView/DS9 to ensure \_eng.fits files matched \_sci.fits files
  -

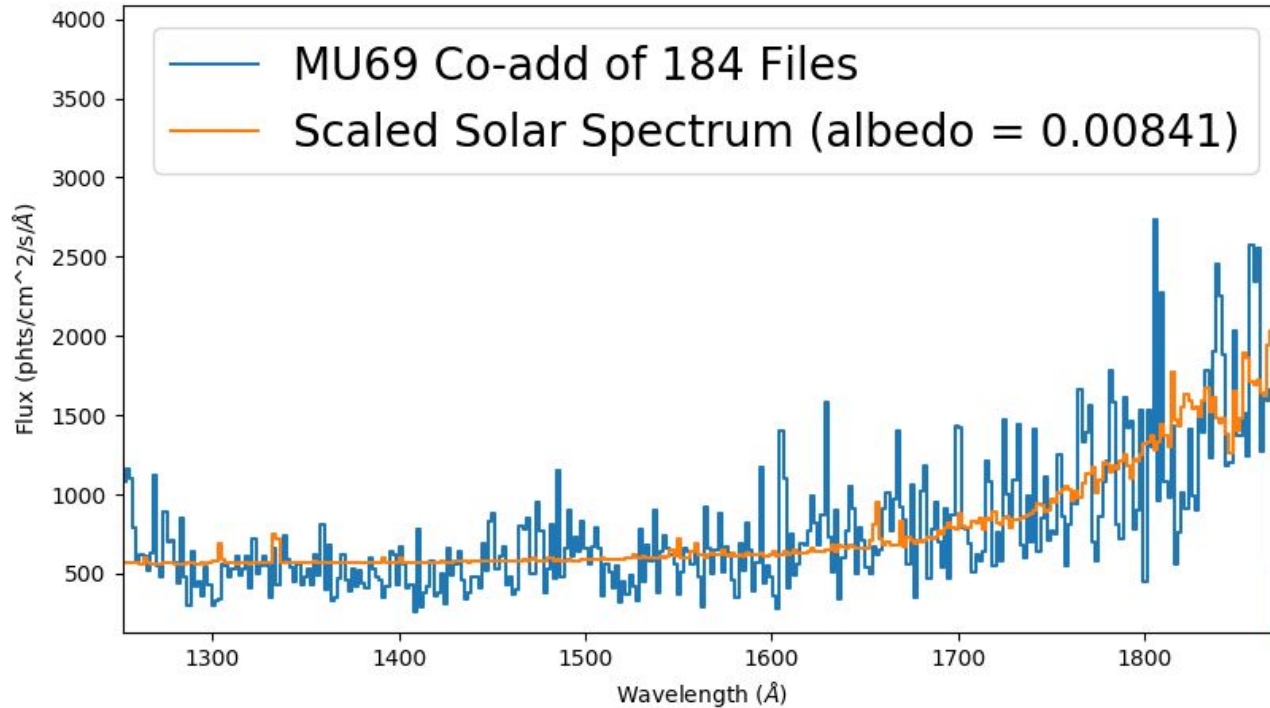
# Example Difference Image: ali\_0429588629\_0x4b2\_sci



# Arrokoth Solar Reflectance Fit ( $a_{UV}=0.01$ , v3.0)

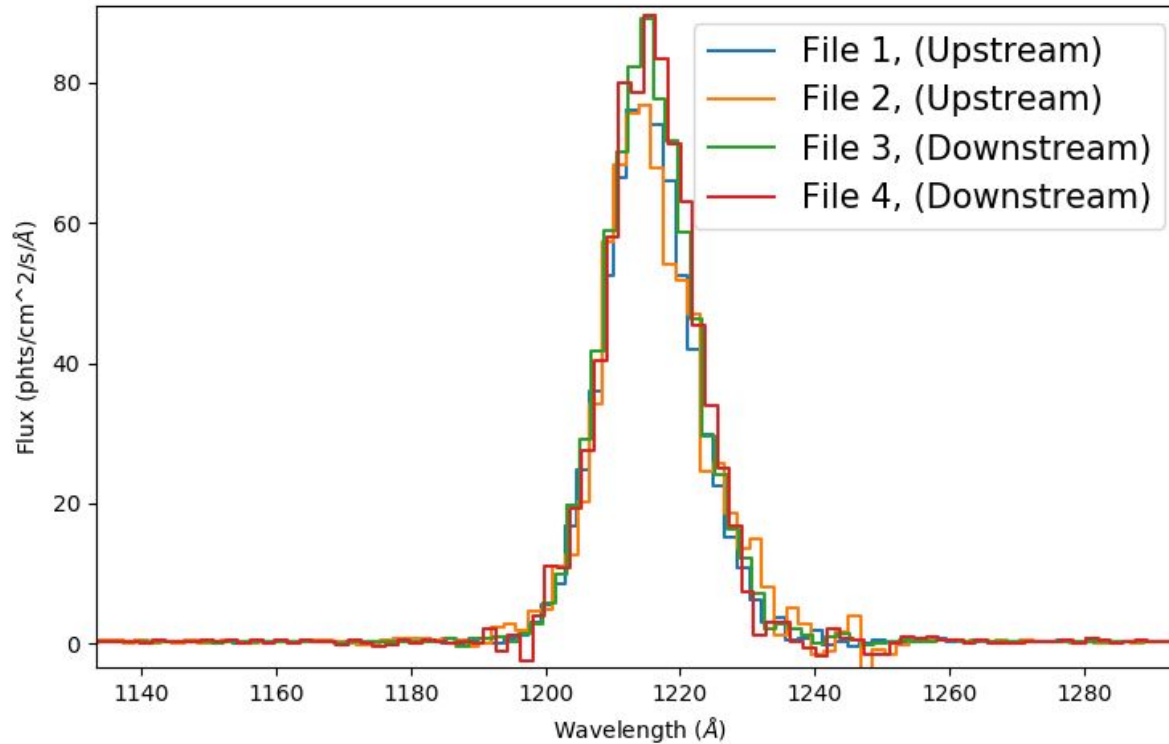


# Arrokoth Solar Reflectance Fit ( $a_{UV}=0.01$ ), v4.0





# IPM Emission Observations (NEW!)



# Major Issues

1. None

# Minor Issue

1. Alice sequence file contains sequences outside of dataset:

```
"ALI", "19234:K2AL_HD93521_705-EFFEC-AREA_CL_2019243      ", "2019-08-31T21:46:09      ", "3/0429593886:00000", "Pointing and Flux Verification"
"ALI", "20096:K2AL_X_701-WAKE-UP-ASIDE-PWR_EN_2020107    ", "2020-04-16T00:10:43      ", "3/0449301760:00000", "Alice WakeUp"
"ALI", "20096:K2AL_X_701-WAKE-UP-ASIDE-PWR_EN_2020107    ", "2020-04-16T00:15:03      ", "3/0449302020:00000", "Alice WakeUp"
"ALI", "20096:K2AL_X_701-WAKE-UP-ASIDE-PWR_EN_2020107    ", "2020-04-16T00:17:03      ", "3/0449302140:00000", "Alice WakeUp"
"ALI", "20112:K2AL_X_805-IPM-DOWNSTREAM-ASIDE-PWR_HS_2020118", "2020-04-27T10:54:38      ", "3/0450290795:00000", "IPM Observations"
"ALI", "20112:K2AL_X_805-IPM-DOWNSTREAM-ASIDE-PWR_HS_2020118", "2020-04-27T11:01:18      ", "3/0450291195:00000", "IPM Observations"
"ALI", "20112:K2AL_X_805-IPM-UPSTREAM-ASIDE-PWR_HS_2020118", "2020-04-27T18:19:38      ", "3/0450317495:00000", "IPM Observations"
"ALI", "20112:K2AL_X_805-IPM-UPSTREAM-ASIDE-PWR_HS_2020118", "2020-04-27T18:26:18      ", "3/0450317895:00000", "IPM Observations"
"ALI", "20112:K2AL_X_703-HV-DARK-TEST-ASIDE-PWR_HS_2020118  ", "2020-04-27T19:55:25      ", "3/0450323242:00000", "HV and Dark Verification"
```