



Joshua Kammer

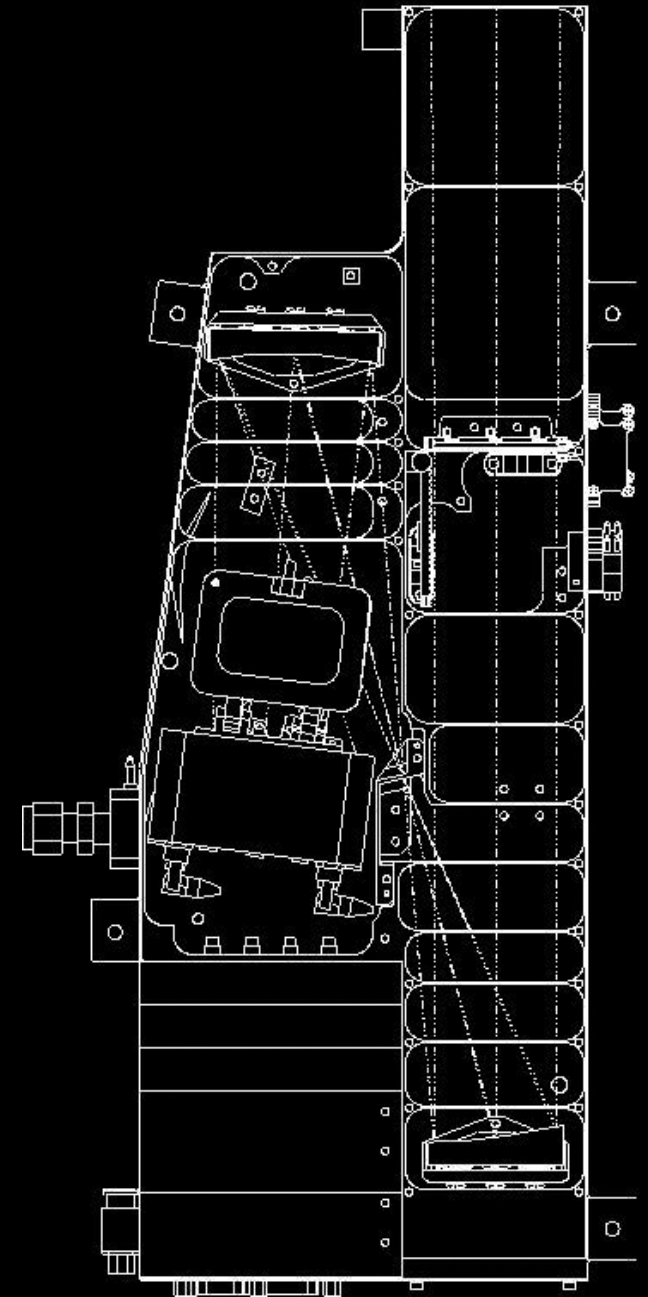
Rosetta Alice

End of Mission (EOM)

PDS/PSA Science Archive Review

Rosetta Alice

- Ultraviolet Imaging Spectrograph
 - Bandpass: 700-2050 Å
 - Spectral Resolution:
 - 5.6 Å (point source)
 - 12.5 Å (extended source at 700 Å)
 - 9.8 Å (extended source at 2050 Å)
 - Active FOV: $0.1^\circ \times 6.0^\circ$
 - Nominal Effective Area:
 - 0.03 cm² (at 1900 Å)
 - 0.53 cm² (at 1150 Å)



R-Alice Datasets

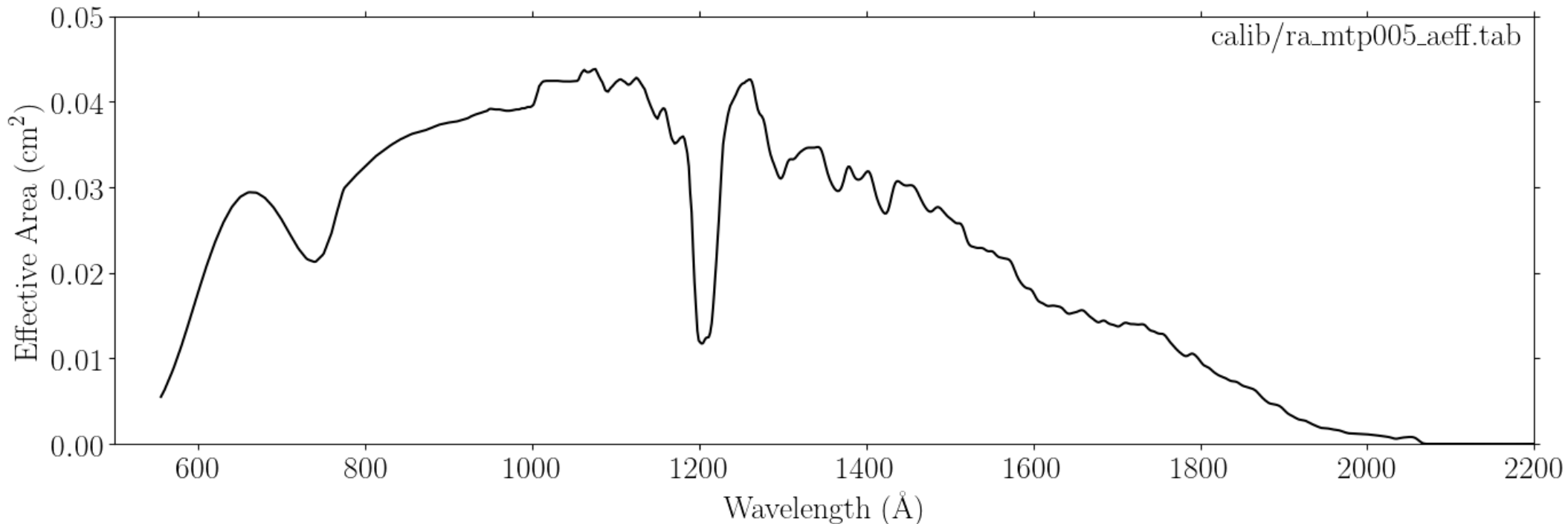
- Spotchecked data from entire mission
 - Prelanding (PRL V2.0)
 - Escort (ESC1 V2.0, ESC2, ESC3, ESC4 V1.0)
 - Extension (EXT1, EXT2, EXT3 V1.0)
- Three data processing levels
 - Level 2: raw data
 - Level 3: calibrated data
 - Level 4: high level / resampled data
- 24 datasets total
- Review Conclusions
 - Data are ready to be released
 - Only minor/editorial RIDs (001-004)

Evaluation Tools

- Dell Inspiron i7559 Laptop
 - Ubuntu 16.04 LTS
 - Python 3.6.2
 - Pandas 0.20.3
 - `pandas.read_table` to read ASCII data
 - Astropy 2.0.2
 - `astropy.io.fits` to read all FITS files
 - Windows 10 Pro
 - NASAView 3.15.0
 - To check ability to read PDS labels

Datasets Review

- Calibration process
 - Well-described (/document/calibration_cookbook.pdf)
 - calib/ directory contains all needed files for utilizing effective area, wavelength vectors, and dark counts at multiple voltage settings (-4000, -4100, -4200, -4300 V)



Datasets Review

- Attempted replication of published results
 - Keeney et al. 2017, MNRAS, 469, S158-S177
 - UV starlight (HD 66006) absorption by cometary coma
 - Appulse: 2015 Aug 10 04:28:49, ~21 min
 - Mission phase ESC3
 - Revisit: 2016 Jun 6 03:27:48, ~30 min
 - Mission phase EXT2

Monthly Notices
of the

ROYAL ASTRONOMICAL SOCIETY

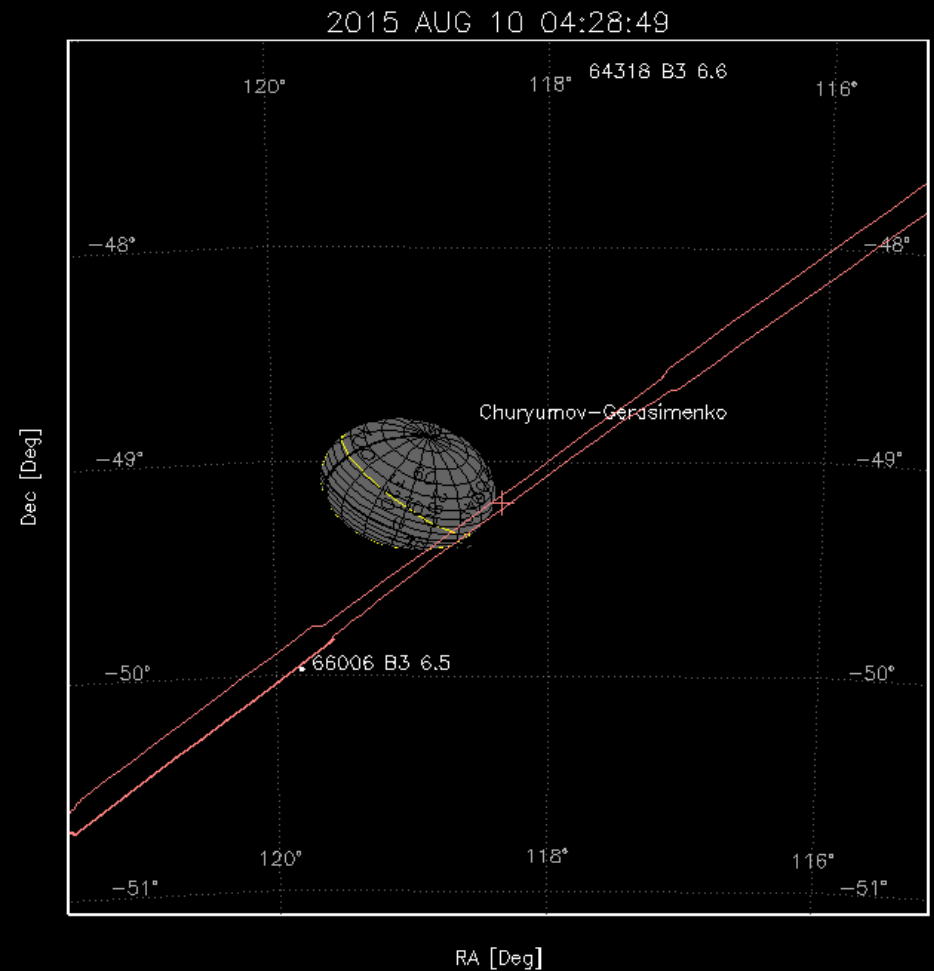
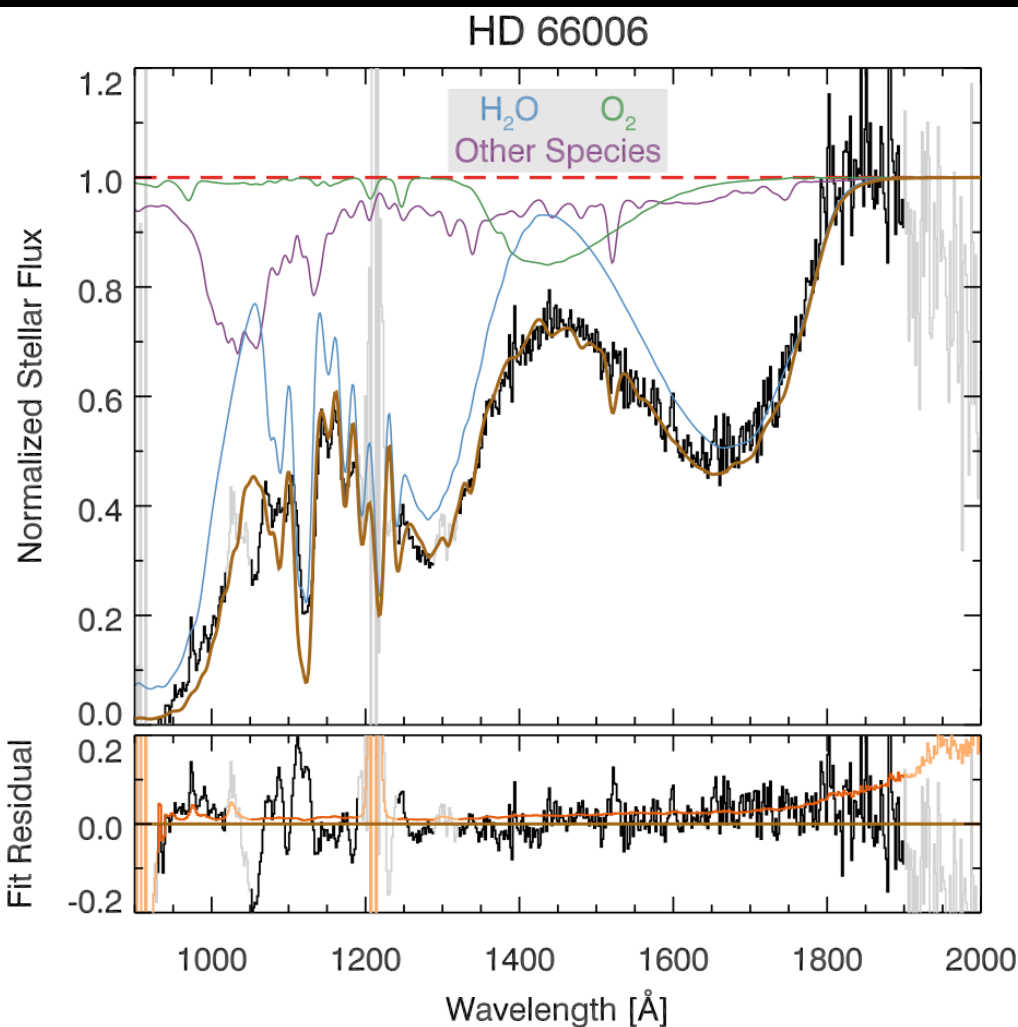


MNRAS **469**, S158–S177 (2017)
Advance Access publication 2017 June 8

doi:10.1093/mnras/stx1426

H₂O and O₂ absorption in the coma of comet 67P/Churyumov–Gerasimenko measured by the Alice far-ultraviolet spectrograph on *Rosetta*

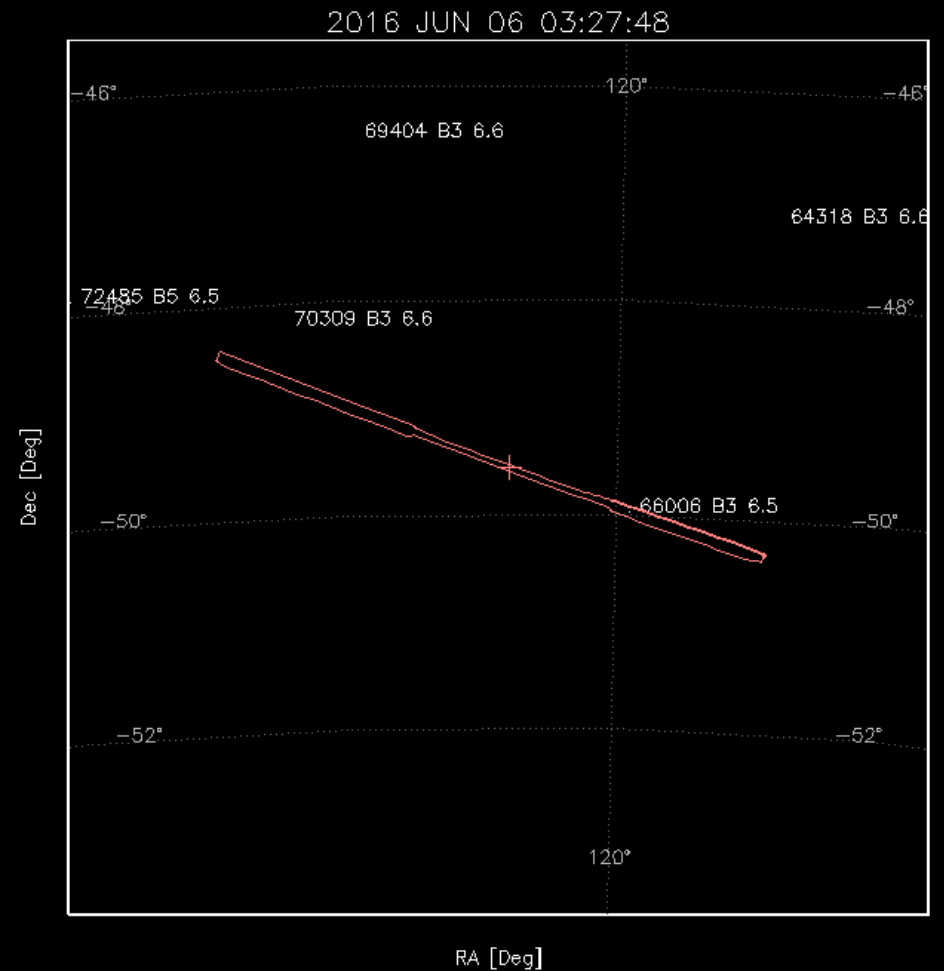
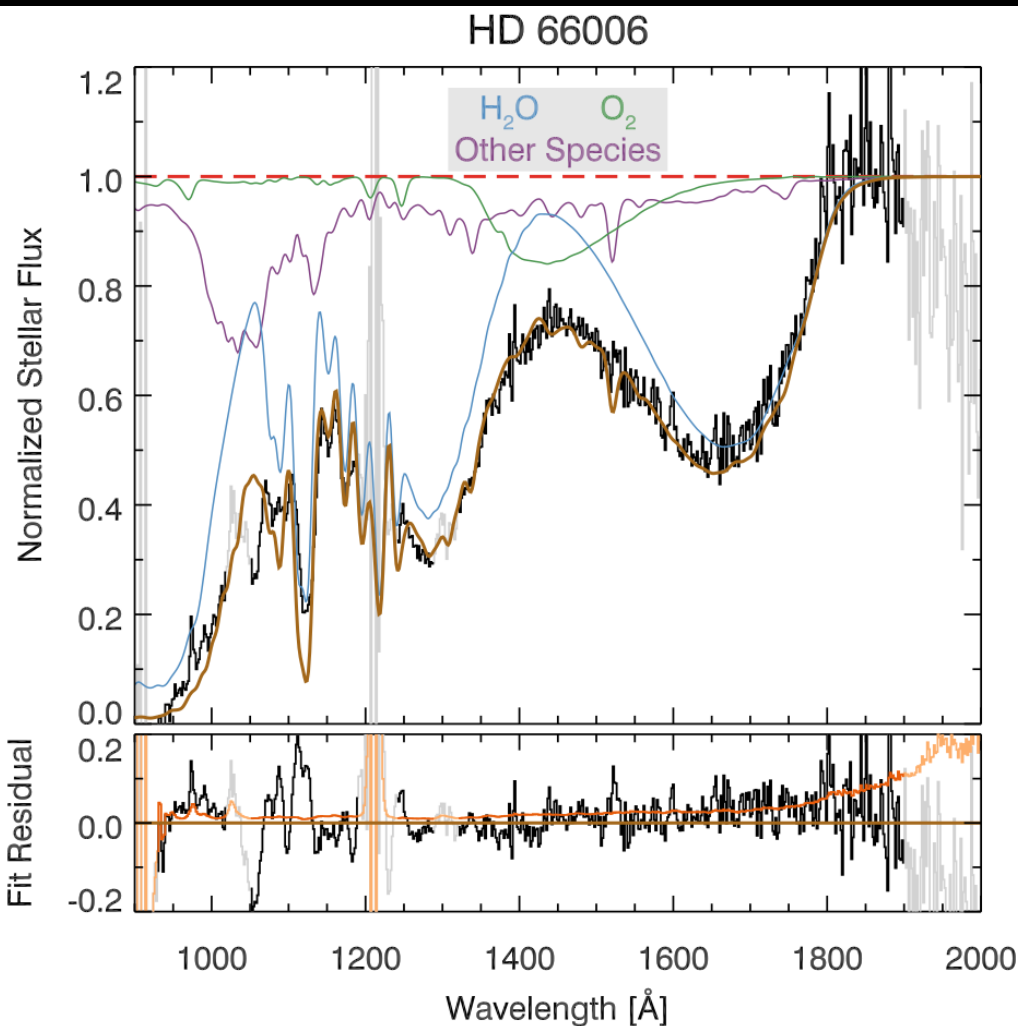
Datasets Review



— Alice
+ FOV Boresight

• $M_V = 6.6$.. 6.6
• $M_V = 6.5$.. 6.6
• $M_V = 6.5$.. 6.5
• $M_V < 6.5$

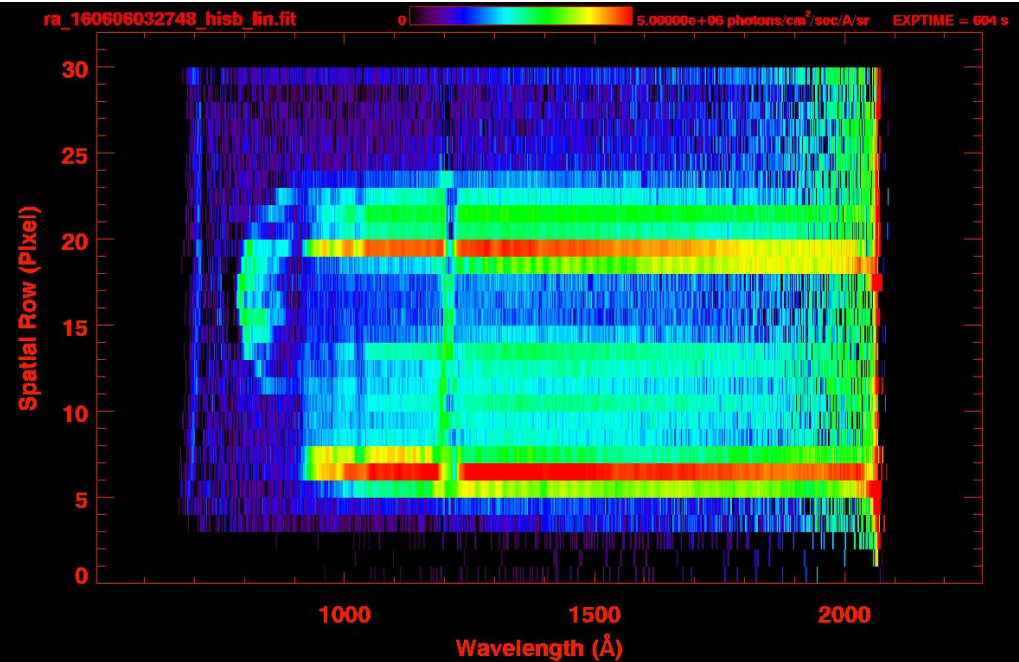
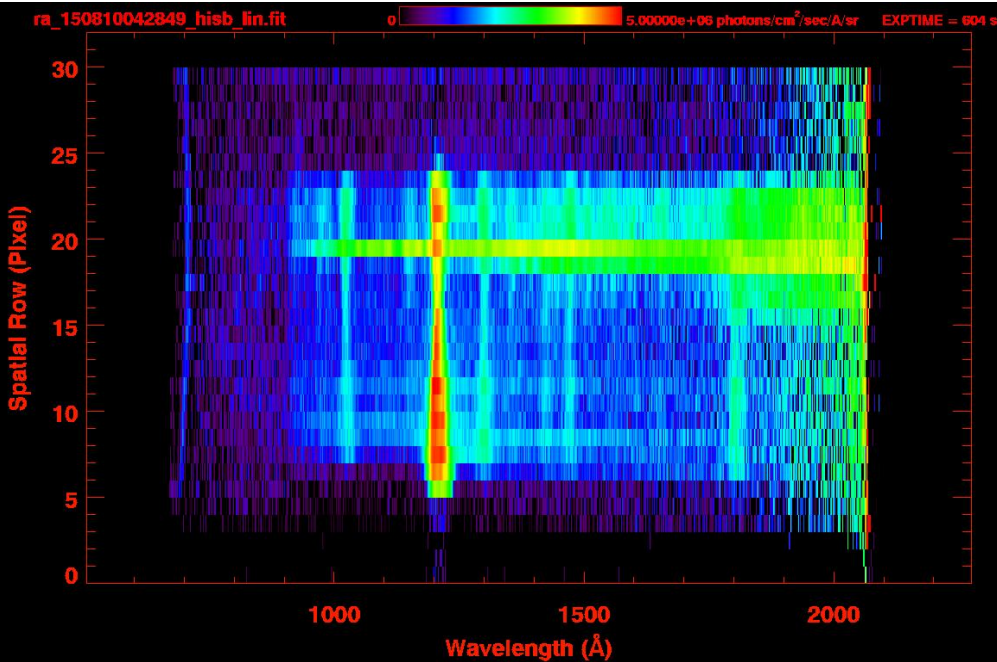
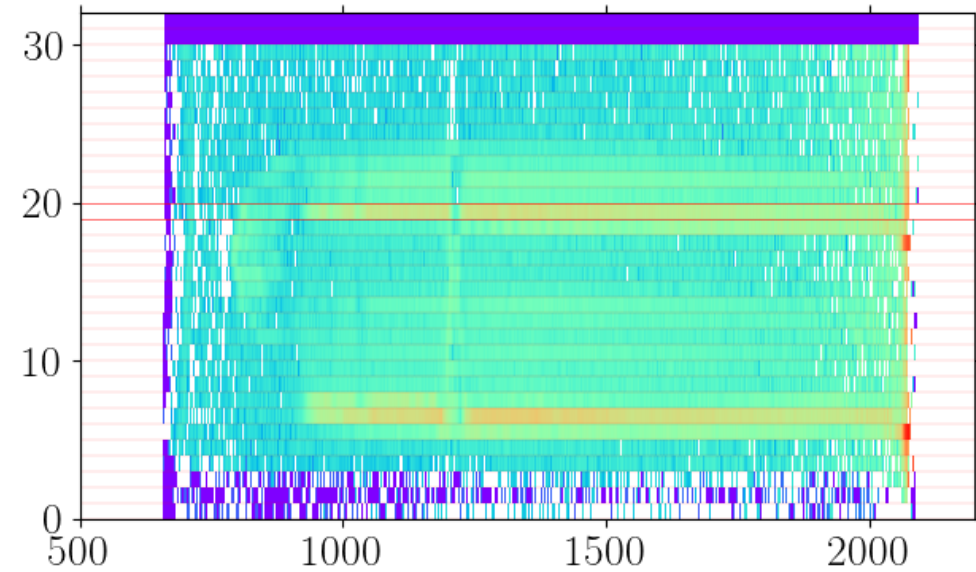
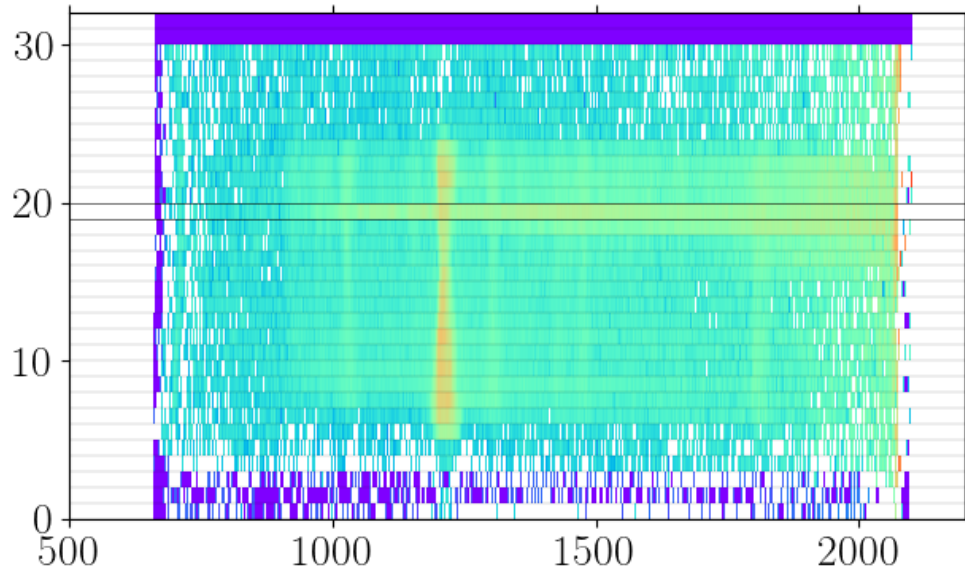
Datasets Review



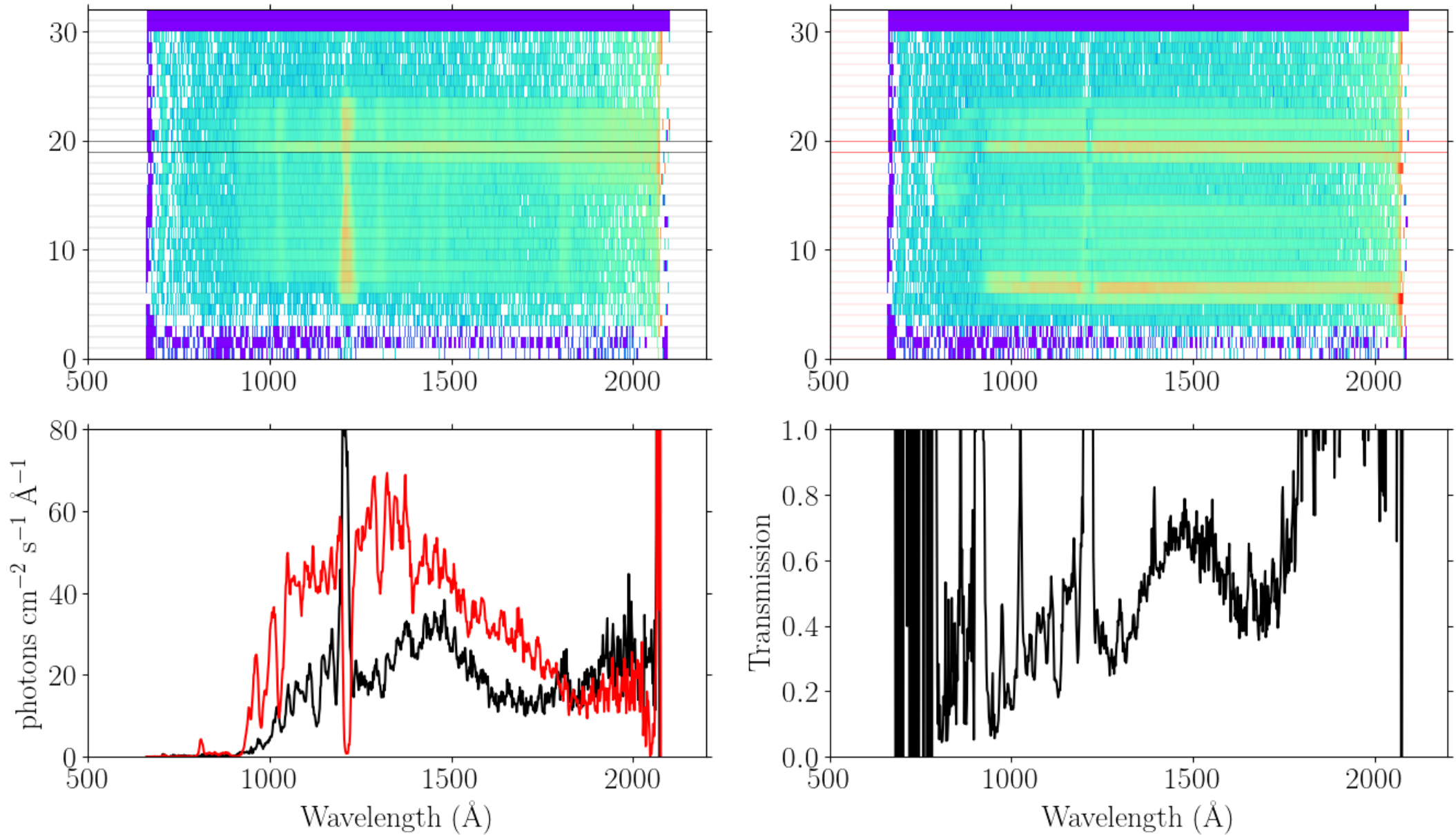
— Alice
+ FOV Boresight

• $M_V = 6.5 \dots 6.6$
• $M_V = 6.5 \dots 6.5$
• $M_V = 6.5 \dots 6.5$
• $M_V < 6.5$

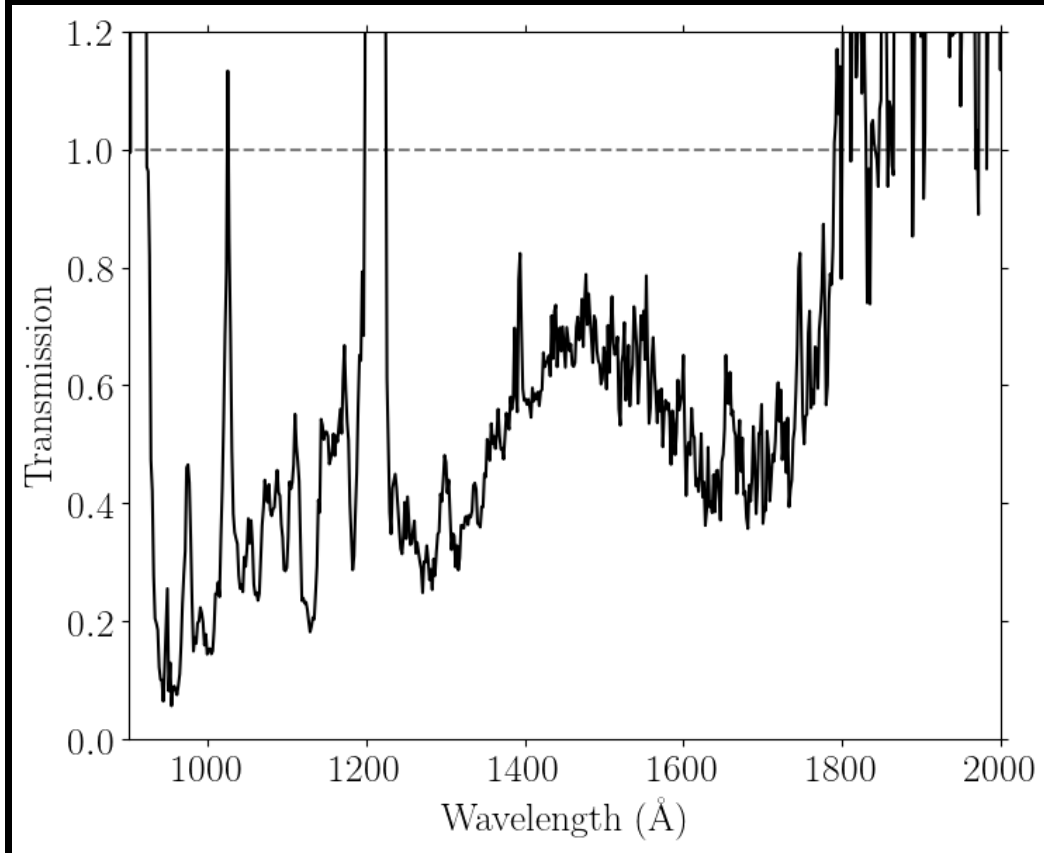
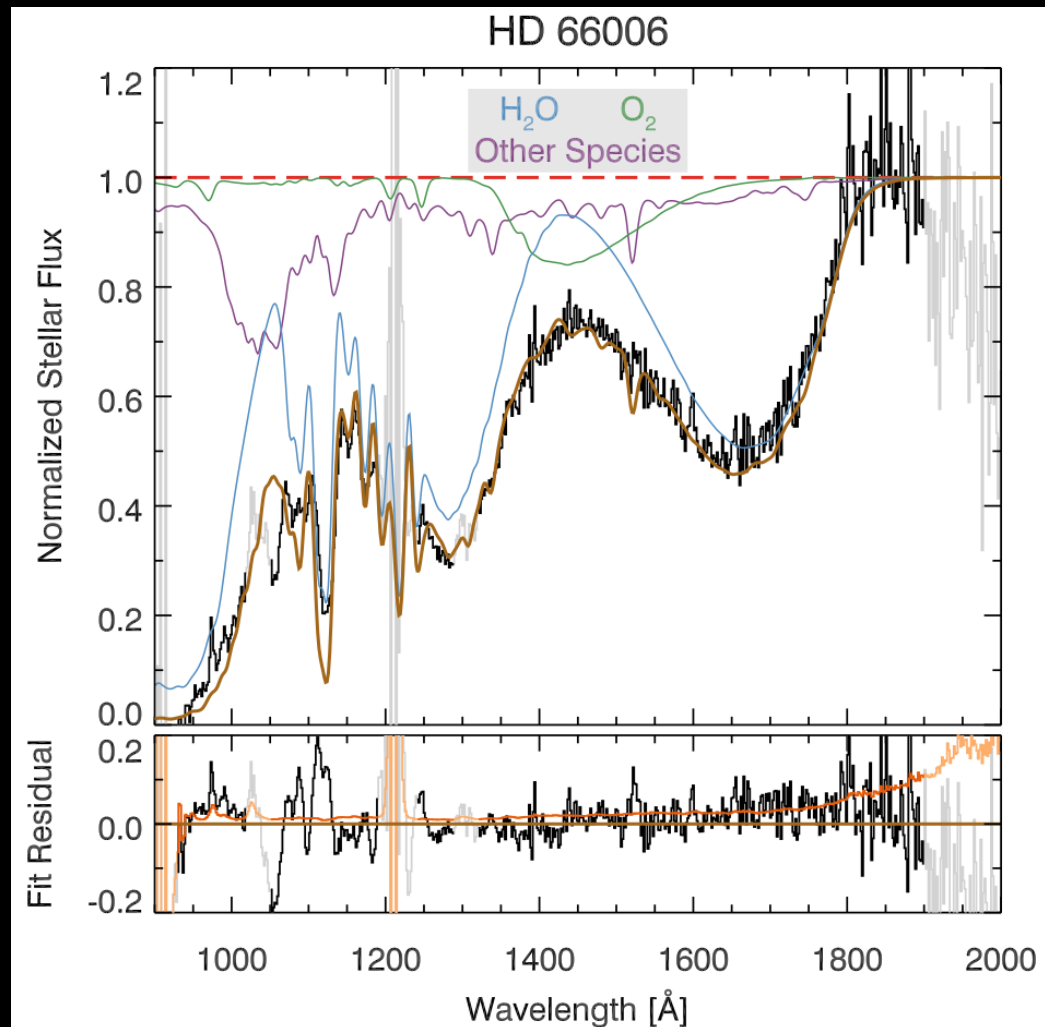
Datasets Review



Datasets Review



Datasets Review



My attempt to replicate

Review Summary

- Archived data appeared complete and easily interpretable
- RIDs: 4 minor
 - 001: EAI CD content
 - 002: Level 4 BROWSE images
 - 003: Additional EAI CD text out of date
 - 004: User manual missing information

RID 001

- Classification: Minor
- Location: /document/eaicd_alice_v4.pdf
- Title: EAICD content
- Description: The information on CODMAC level 4 data in sections 4.3 and 4.6 are copied from the level 3 sections (4.2 and 4.5) and still reference level 3 data. Sections 4.3 and 4.6 are not listed correctly in the table of contents.
- Recommended Solution: Update these sections of the EAICD to reference level 4 information, and correct the table of contents

RID 002

- Classification: Minor
- Location: /browse/
- Title: Level 4 browse images
- Description: The browse images display the data in units of photons $\text{cm}^{-2} \text{s}^{-1} \text{Angstrom}^{-1} \text{sr}^{-1}$, while the level 4 data is in units of photons $\text{cm}^{-2} \text{s}^{-1} \text{Angstrom}^{-1}$, making direct comparison difficult
- Recommended Solution: Update the browse images to use the same units as the *.LIN.FIT files to which they correspond (photons $\text{cm}^{-2} \text{s}^{-1} \text{Angstrom}^{-1}$)

RID 003

- Classification: Minor
- Location: /document/eaicd_alice_v4.pdf
- Title: Additional EAICD text out of date
- Description: Section 3.1.3 (Data Directory Naming Convention) does not mention the level 4 data. Section 3.4.3.5 indicates that the BROWSE directory is not used, but it is. Section 3.4.3.12 describes the DATA directory, but also does not mention the Level 4 data. Typo in section 2.3.4 (CODEMAC->CODMAC)
- Recommended Solution: Update the text to include reference to Level 4 data and what is included in the BROWSE directory. Fix minor typo (CODEMAC->CODMAC)

RID 004

- Classification: Minor
- Location: /document/alice_manual_v2_1.pdf
- Title: User manual missing info
- Description: Attachments 1-10 at the end of the manual are missing/blank
- Recommended Solution: Include the relevant attachments, or remove the blank pages if the attachments are unnecessary