Dataset: **EPOXI HRI-IR EPOCh Earth Calibrated Spectra v2.0** **Web-Folder:** holdings/dif-e-hrii-3_4-epoxi-earth-v2.0	
Wavelength (dataset.cat)**:** 1.05–4.8-micron spectra (calibrated)	
Instrument (dataset.cat)**:** High Resolution IR Spectrometer (HRII)	
Target (dataset.cat)**:** Earth	
Data sets (dataset.cat)**:** 5	18-19 March 2008 28-29 May 2008 04-05 June 2008 27-28 March 2009 04-05 October 2009
Description (epoxi.cat): On 18-19 March, 28-29 May, and 4-5 June 2008, the observations comprised imaging in **2- to 5**-micron infrared spectroscopy over a full Earth rotation. The HRII spectrometer was 512 (wavelength) by 128 pixels (spatial, 2 arcsec/pixel). Infrared spectra were obtained twice per hour by scanning the slit of the HRII spectrometer over the earth, using three scans to ensure coverage of the entire disk; the slit was aligned perpendicular to the terminator during the scans. The spacecraft orbit was approximately in the plane of the ecliptic, which provided an equatorial view of Earth with about 62 to 77 percent of the disk illuminated. Each of the three Earth observing periods lasted approximately 24 hours. EPOCh continued observations in 2009. These included Earth at both northern and southern latitudes using the same sequence from 2008.	
Reviewer(s):	Lucas Paganini (primary) Neil Dello Russo (secondary)

1) Directory structure:

catalog/: √
calibration/: √
document/: √
index/: √
data/: √

Full description:

```
/                Top level of volume
 |
 |-- AAREADME.TXT      This file
 |
 |-- VOLDESC.CAT       Description of the logical contents of this volume
 |
 |--/CALIB/            Directory containing calibration files
 |
 |--/CATALOG/          Directory containing PDS catalog files providing overviews of the mission, instrument, and
dataset
```

```
|
|--/DATA/          Directory containing calibrated data products
| |
| |--/RADREV/      Reversibly calibrated spectra in radiance units
| | |
| | +--/YYYY/      Multiple year directories, as needed
| |   |
| |   +--/DDD/     Multiple day-of-year directories
| |     |
| |     |-- *.FIT   FITS file, 2-D spectral image with four extensions
| |     +-- *.LBL   PDS label, one for each FITS file
| |
| +--/RAD/         Irreversibly calibrated spectra in radiance units
|   |
|   +--/YYYY/      Multiple year directories, as needed
|     |
|     +--/DDD/     Multiple day-of-year directories
|       |
|       |-- *.FIT   FITS file, 2-D spectral image with four extensions
|       +-- *.LBL   PDS label, one for each FITS file
|
|--/DOCUMENT/      Directory containing documents most useful understanding this dataset
|
+--/INDEX/         Directory containing PDS index files
```

Consistency	Directory structure is complete.
Notes	• During the observing period in May 2008, the Moon transited across Earth as seen from the spacecraft. • Version 2 corrects an error in the IR absolute calibration that previously inflated all spectra by a factor of 2. It also includes the application of an improved flat field and a corrected spacecraft clock algorithm to remove a known systematic error at the subsecond level in the conversion of the spacecraft times to UTCs. • At every half hour of each observing period, the spacecraft slewed across the Earth while the IR spectrometer recorded data; these scans were performed three times within several minutes, alternating direction from south-to-north and north-to-south. **Each scan consisted of eight 128x256 binned subframes.** Each half-hour set alternated between slower scans with longer frame exposure times and faster scans with shorter frame durations.

2) Catalog files (catalog/catinfo.txt)

File	Status	Comments
CATINFO.TXT	√	Descriptive.
EPOXI.CAT	√	Descriptive.
DIF.CAT, HRII.CAT	√	Descriptive.
DATASET.CAT	√	Descriptive. Spectral Scanning mode not so clear.
REF.CAT	√	Descriptive.

Notes: *dataset.cat* would benefit from a description of the goals of each dataset. Currently, some details can be found in epoch_earth_xyz.pdf in folder "Documents."

3) Documentation (document/docinfo.txt)

Consistency	Directory structure is complete. Information is descriptive.
Notes	None.

4) Addition browsing (browse/)

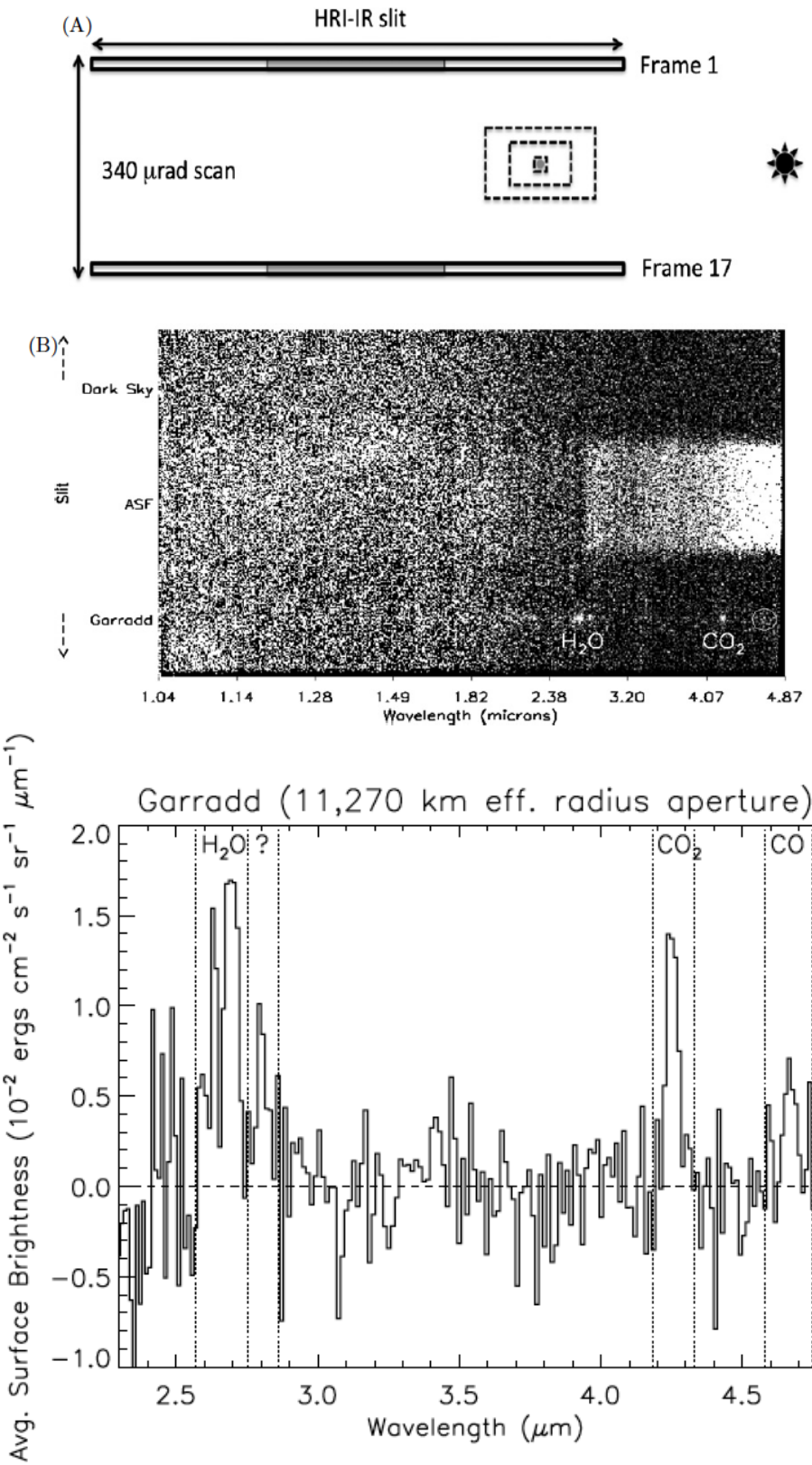
Consistency	Nonexistent.
Notes	–

5) Data (data/)

Folder	Status	Comments
RADREV	√	Calibrated but uncleaned data in units of radiance (calibration steps can be reversed to get back to the raw DN) – **Level 3 data**. Units of radiance as *Watts/(meter² steradian micron)*
RAD	√	Calibrated and irreversibly cleaned data in units of radiance – **Level 4 data**. Units of radiance as *Watts/(meter² steradian micron)*

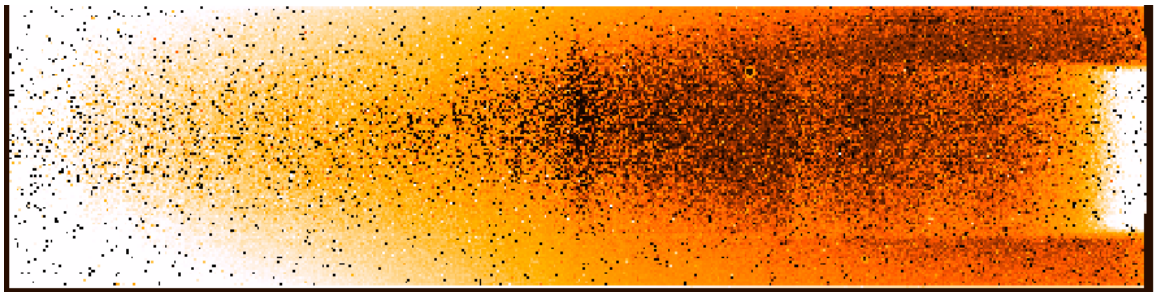
Consistency	Directory structure is complete.
Notes	• Are some frames overexposed? • Extension 0: Radiance • Extension 1: Quality map (data flags) • Extension 2: Wavelength (micron) • Extension 3: Resolution per pixel • Extension 4: Signal-to-noise ratio

Example of cometary data (Feaga et al. 2014):

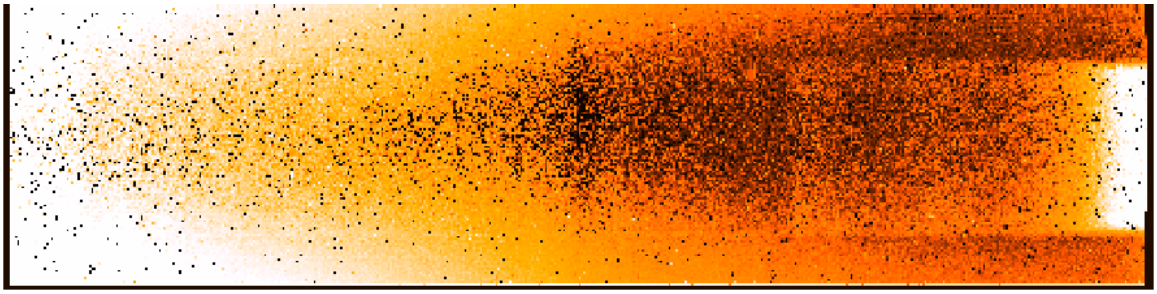


Examples

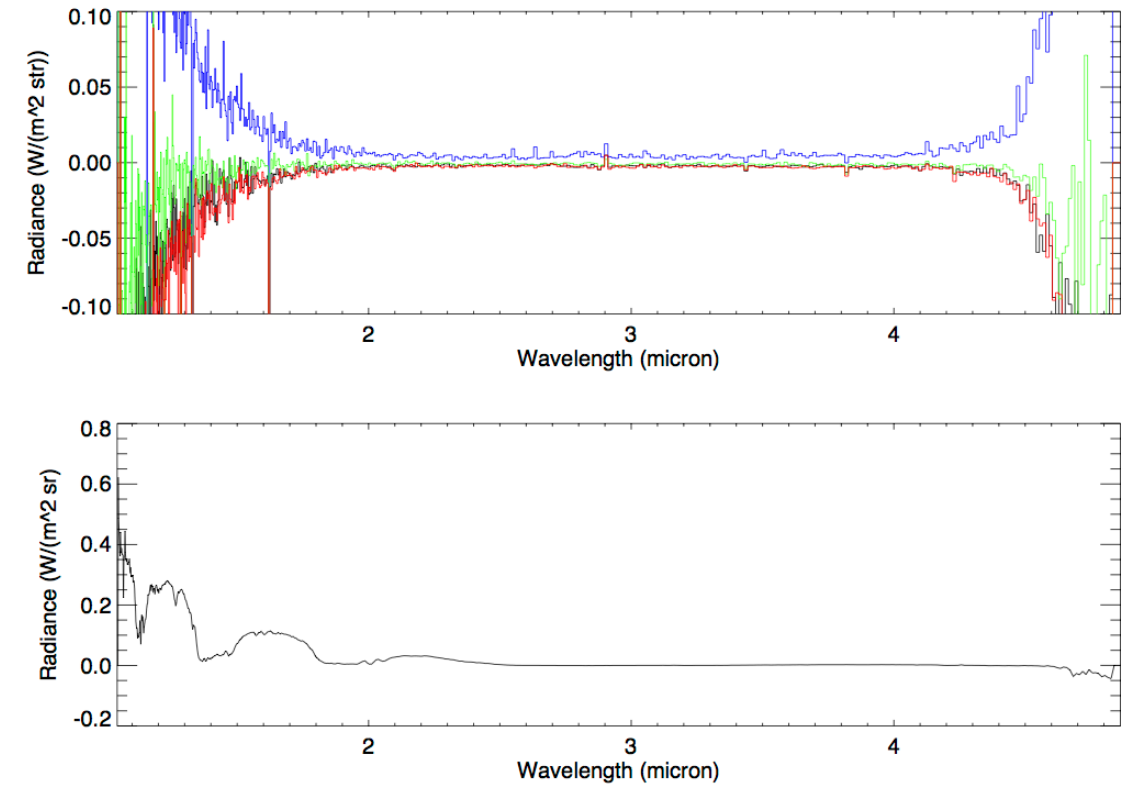
RADREV:

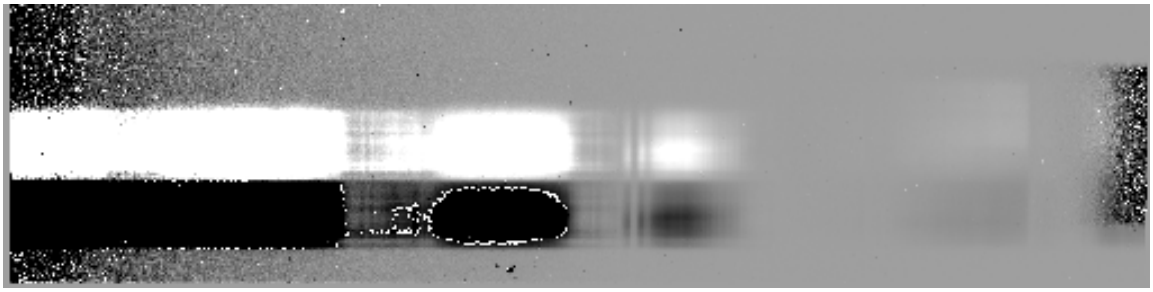


RAD:

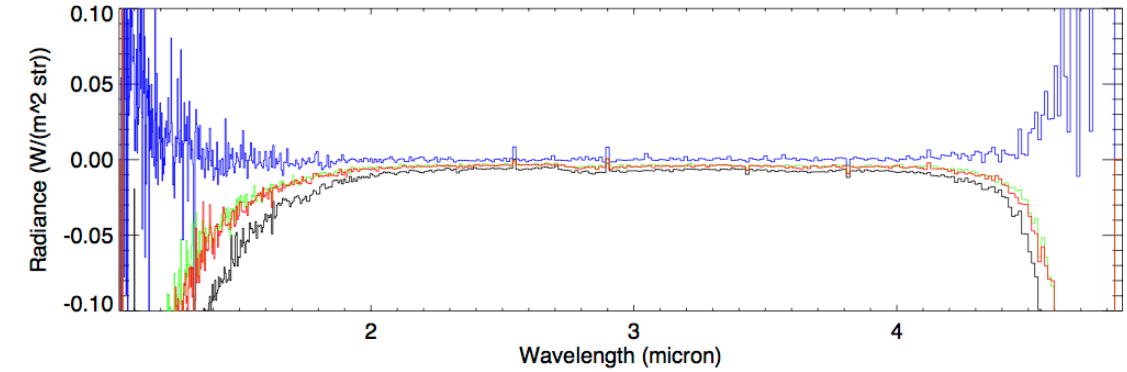


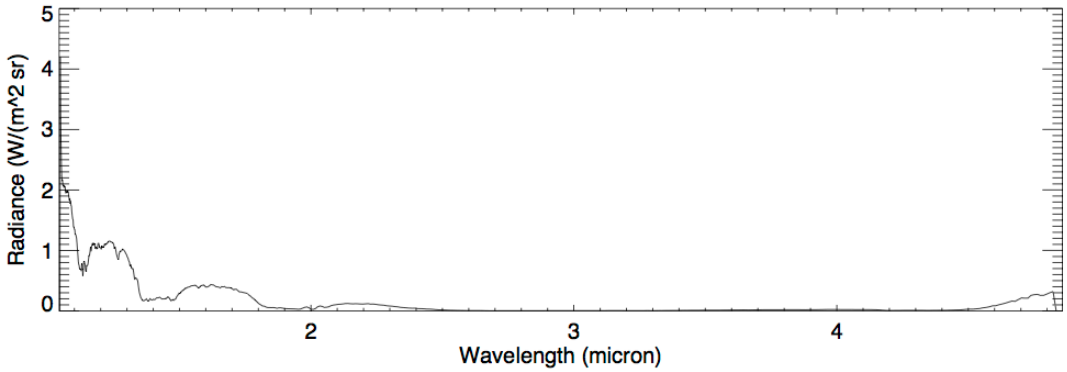
Spectral samples from current database:

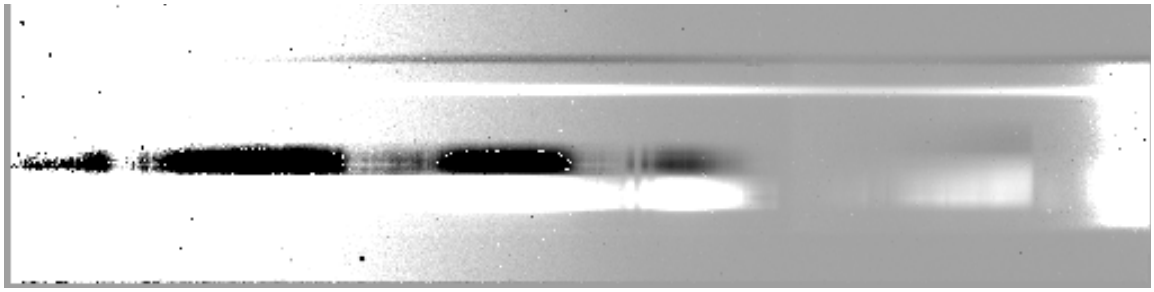




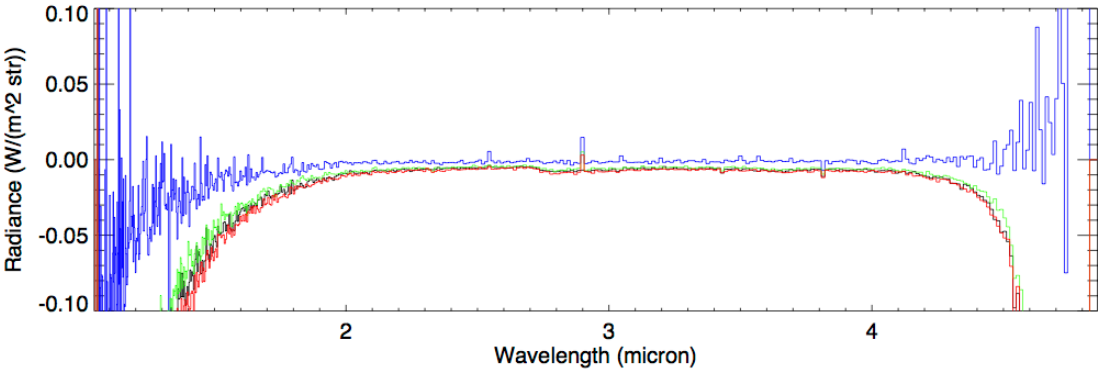
Folder: dif-e-hrii-3_4-epoxi-earth-v2.0/data/rad/2008/078/
Upper: black, blue, red and green represent 4 different scans. Middle: spectrum of 16 stacked frames (11-row integration). Bottom: stacked (16) frames showing some nodding. Note: y-axis unit is *W/(m² sr micron)*

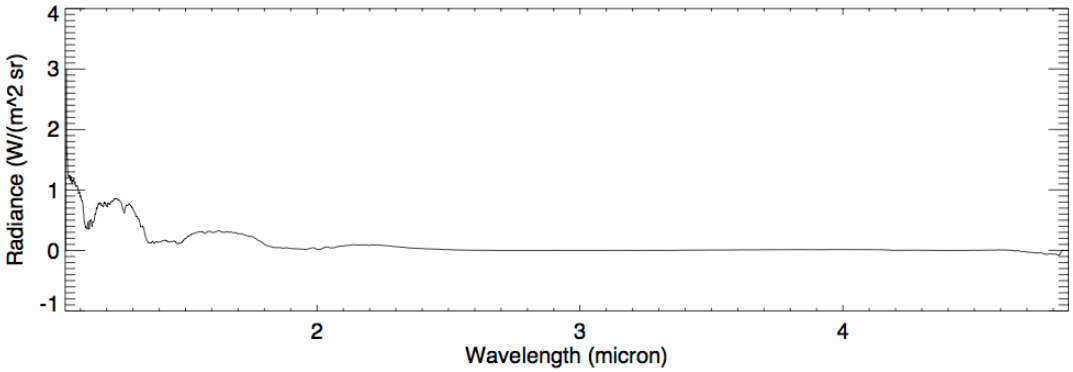


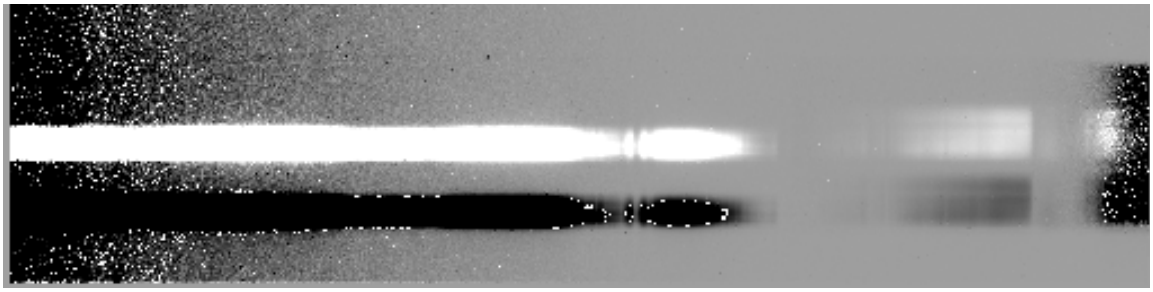




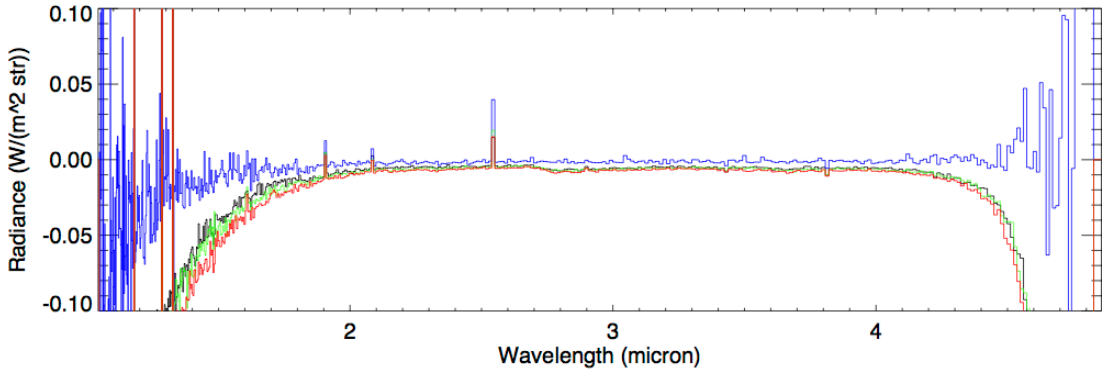
Folder: dif-e-hrii-3_4-epoxi-earth-v2.0/data/rad/2008/150/
Upper: black, blue, red and green represent scans 1, 2, 3 and 4. Middle: spectrum of 16 stacked frames (11-pix integration). Bottom: stacked (16) frames (**Moon transiting).** Note: y-axis unit is *W/(m² sr micron)*

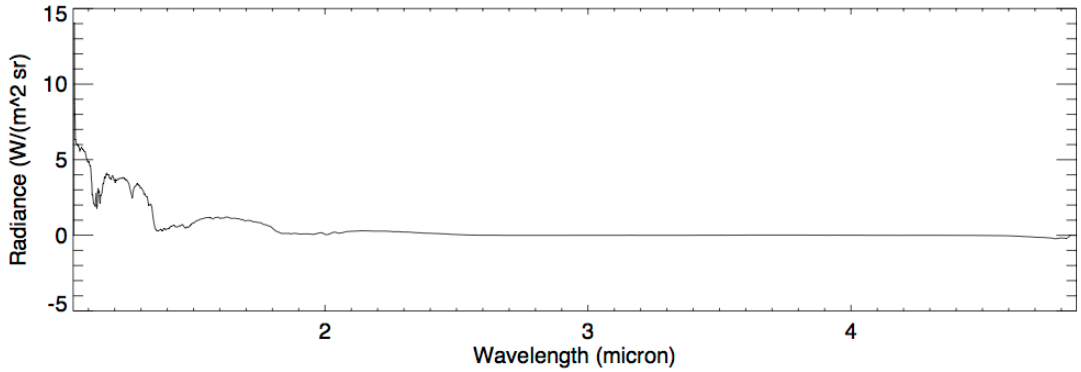


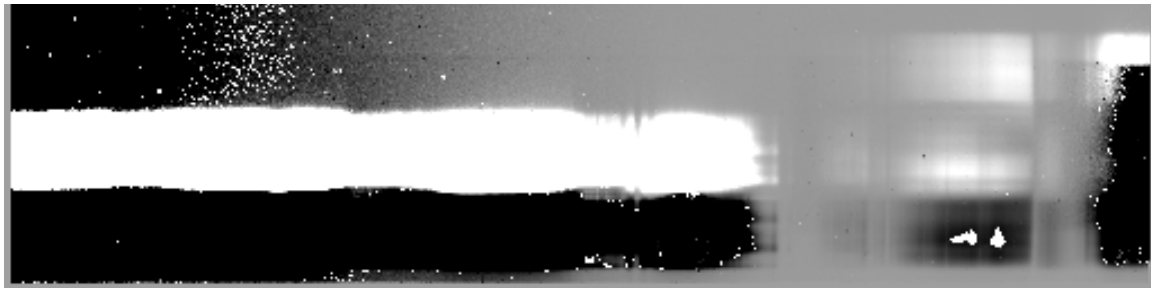




Folder: dif-e-hrii-3_4-epoxi-earth-v2.0/data/rad/2008/157/
Note: y-axis unit is *W/(m² sr micron)*







Folder: dif-e-hrii-3_4-epoxi-earth-v2.0/data/rad/2009/086/
Note: y-axis unit is *W/(m² sr micron)*

Final comments	• Check if values in the frame's edges are a result of nonlinearities • What was the observing strategy in detail? • Was there any intentional nodding? • Check the possible effect of different distances between Earth and spacecraft

6) Remaining directories (geometry, software, extras)

Consistency	Nonexistent.
Notes	• There should be an "EXTRAS/" directory with samples of final spectra; most desirably, some simple recipes to extract

	data. • *aareadme.txt* should contain clear information pointing to the important ASCII/PDF files and their contents, such as *dataset.txt*