Dataset: Spectral images of Mars acquired the High Resolution Infrared Spectrometer (HRII). Calibrated Spectra v1.0

Web-Folder: holdings/dif-m-hrii-3_4-epoxi-mars-v1.0

Wavelength (dataset.cat): 1.05–4.8-micron spectra (calibrated)

Instrument (dataset.cat): High Resolution IR Spectrometer (HRII)

Target (dataset.cat): Mars

Data sets (dataset.cat): 2 20-21 November 2009 18 December 2009

Description (dataset.cat):

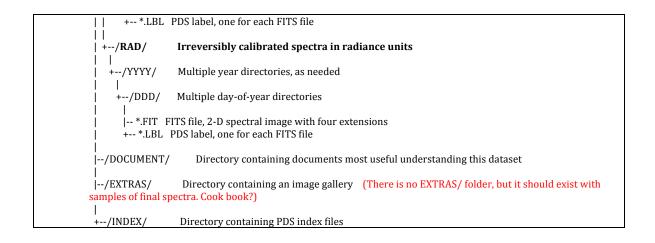
Calibrated spectra of Mars acquired by HRII for the EPOCh project during the second cruise phase of the EPOXI mission. One set of observations was acquired on 20-21 November 2009 to characterize Mars as an analog for extrasolar planets. The observing period lasted approximately 24 hours, and spectra were acquired twice per hour.

Reviewer(s):	Lucas Paganini (primary)
	Neil Dello Russo (secondary)

1) Directory structure:

catalog/: $\sqrt{\text{calibration/:}}$ $\sqrt{\text{document/:}}$ $\sqrt{\text{index/:}}$ $\sqrt{\text{data/:}}$

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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
```



Consistency	Directory structure is complete.
Notes	These data were originally peer reviewed in September
	2010 but were rejected due to an error in the absolute
	calibration that inflated all spectra by a factor of 2. The data
	were reprocessed in 2013 with the correct absolute
	calibration
	 At every half hour of each observing period, the spacecraft
	slewed across Mars while the IR spectrometer recorded data;
	these frames 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
	frames with longer frame exposure times and faster frames
	with shorter frame durations

2) Catalog files (catalog/catinfo.txt)

File	Status	Comments
CATINFO.TXT	$\sqrt{}$	Descriptive.
EPOXI.CAT	$\sqrt{}$	Descriptive.
DIF.CAT, HRII.CAT	$\sqrt{}$	Descriptive.
DATASET.CAT	$\sqrt{}$	Descriptive.
REF.CAT	V	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.
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Notes	None.
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4) Addition browsing (browse/)

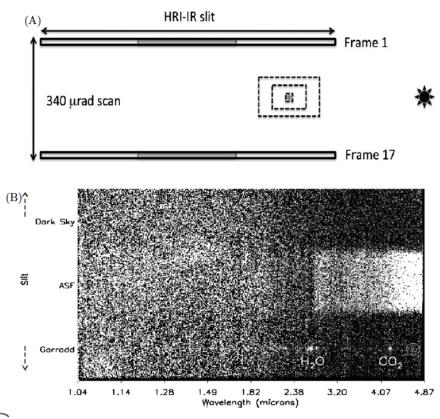
Consistency	Nonexistent.
Notes	_

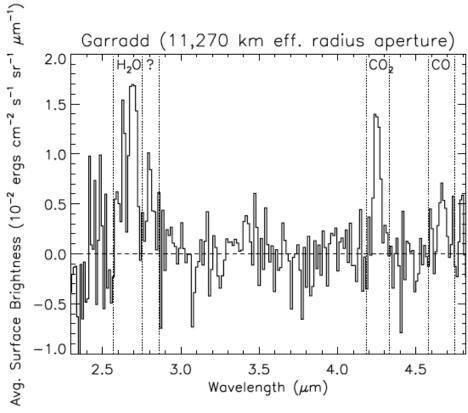
5) Data (data/)

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	 Frame size 512x256 pixels² 	
	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

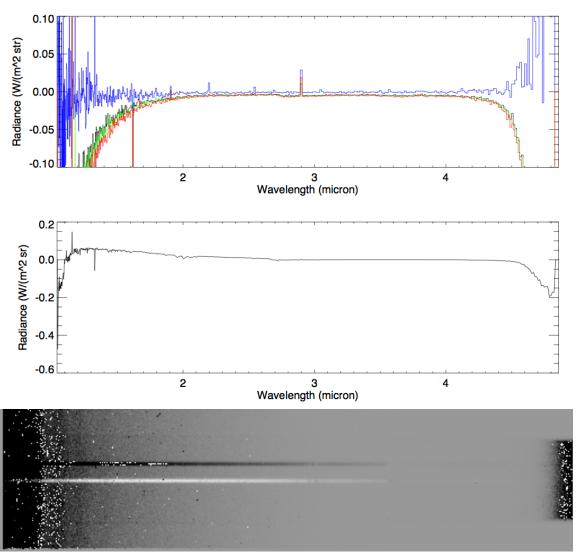
RAD-1:



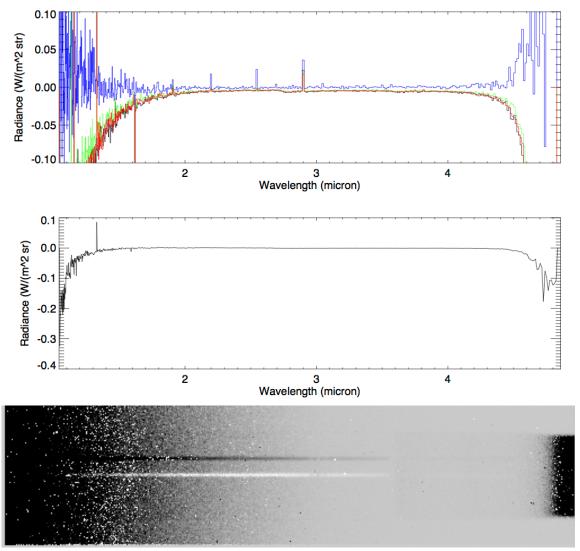
RAD-2:



Spectral samples from current database (selections due to different frame sizes):



Folder: dif-m-hrii-3_4-epoxi-mars-v1.0/data/rad/2009/324 (first 16 frames). Upper: black, blue, red and green represent frames 1, 2, 3 and 4. Middle: spectrum of 8 stacked frames (3-pix integration). Bottom: stacked A – B, i.e. frames (1–8) - frames (8–16). Note: y-axis unit is $W/(m^2 sr micron)$



Folder: dif-m-hrii-3_4-epoxi-mars-v1.0/data/rad/2009/324 (first 16 frames). Upper: black, blue, red and green represent frames 1, 2, 3 and 4. Middle: spectrum of 8 stacked frames (3-pix integration). Bottom: stacked A – B, i.e. frames (1–8) - frames (8–16). Note: y-axis unit is $W/(m^2 sr micron)$

Final comments	 Beam position changes along the slit (more than 2 positions) It was not clear what the goal of these observations and their strategy were. Bad pixels
	 No major issues

6) Remaining directories (geometry, software, extras)

Consistency	Nonexistent.
Notes	 aareadme.txt should contain clear information pointing to the important ASCII/PDF files and their contents, such as dataset.txt

Typos:

In Data Set Overview and in Spectral Frames (dataset.cat): "across the Mars" > "across Mars"