
Mars Odyssey Mission Dictionary

NASA Planetary Data System

Jan 20, 2026

USER GUIDE

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PDS4 2001 Mars Odyssey Mission Data Dictionary User's Guide

Last edited: 2026-01-20

**CHAPTER
ONE**

INTRODUCTION

1. Purpose of this User's Guide

- This User's Guide provides an overview of the 2001 Mars Odyssey Mission Data Dictionary. The guide details how to include the dictionary in a PDS4 label, describes the organization of the dictionary's classes and attributes, provides definitions for these classes and attributes, and lists example excerpts from labels that use them.

2. Audience

- This User's Guide should be useful to data providers intending to archive 2001 Mars Odyssey data with PDS as well as PDS Nodes who are working with these data providers.

**CHAPTER
TWO**

OVERVIEW OF THE 2001 MARS ODYSSEY MISSION DATA DICTIONARY

The 2001 Mars Odyssey Mission Data Dictionary contains classes and attributes specific to the 2001 Mars Odyssey mission and its instruments.

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**CHAPTER
THREE**

DOCUMENT OUTLINE

1. [How to Include the 2001 Mars Odyssey Mission Data Dictionary in a PDS4 Label](#how-to-include-the-2001-Mars-Odyssey-Mission-data-dictionary-in-a-pds4-label)
2. *Organization of Classes and Attributes*
 1. *Class Organization*
 2. *Attributes by Class*
3. *Definitions*
 1. *Classes (in alphabetical order)*
 2. *Attributes (in alphabetical order)*
4. *Examples*
5. *Edit History*

**CHAPTER
FOUR**

HOW TO INCLUDE THE 2001 MARS ODYSSEY MISSION DATA DICTIONARY IN A PDS4 LABEL

The dictionary consists of a set of files with names in the form PDS4_ODY_xxxx_yyyy.ext, where

- xxxx = the PDS4 Information Model version, e.g. 1L00
- yyyy = the 2001 Mars Odyssey Mission Data Dictionary version, e.g. 1030

and the file extensions are

- .csv = A comma-separated value table of dictionary attributes
- .JSON = The dictionary contents in JSON format
- .sch = The dictionary “rules” as an XML Schematron file
- .txt = The report generated when the dictionary was built
- .xml = The PDS4 label that describes this set of files
- .xsd = The dictionary contents as an XML schema file

Only the schema and Schematron files are needed for validating a PDS4 label.

The latest version of this dictionary may be found on the PDS web site at <https://pds.nasa.gov/datastandards/dictionaries/index-missions.shtml#ody>.

The following is an example showing the use of this dictionary in a PDS4 label.

```
<?xml version="1.0" encoding="UTF-8"?>
<?xml-model href="https://pds.nasa.gov/pds4/pds/v1/PDS4_PDS_1L00.sch" schematypens=
  "http://purl.oclc.org/dsdl/schematron"?>
<?xml-model href="https://pds.nasa.gov/pds4/mission/ody/v1/PDS4_ODY_1L00_1030.sch"?>
  schematypens="http://purl.oclc.org/dsdl/schematron"?>
<Product_Observational xmlns="http://pds.nasa.gov/pds4/pds/v1"
  xmlns:ody="http://pds.nasa.gov/pds4/mission/ody/v1"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="https://pds.nasa.gov/pds4/pds/v1/PDS4_PDS_1L00.xsd
    https://pds.nasa.gov/pds4/mission/ody/v1/PDS4_ODY_1L00_1030.xsd">
```

The following is a schematic example showing the location of every 2001 Mars Odyssey Mission Data Dictionary class and attribute in a PDS4 label. Note that not all classes and attributes may be mutually compatible, and the example does not include any recursion, even if recursion is allowed.

```
<Observation_Area>
  ...
  <Mission_Area>
```

(continues on next page)

(continued from previous page)

```
<ody:ODY_Parameters>
  <ody:product_type/>
  <ody:orbit_number/>
  <ody:THEMIS_Observation_Context>
    <ody:spacecraft_orientation_pitch/>
    <ody:spacecraft_orientation_roll/>
    <ody:spacecraft_orientation_yaw/>
    <ody:spacecraft_pointing_mode/>
  </ody:THEMIS_Observation_Context>
  <ody:THEMIS_Instrument_Attributes>
    <ody:detector_id/>
    <ody:flight_software_version_id/>
    <ody:command_sequence_number/>
    <ody:spatial_summing/>
    <ody:interframe_delay/>
    <ody:exposure_duration/>
    <ody:inst_compression_name/>
    <ody:gain_number/>
    <ody:offset_number/>
    <ody:rice_flag/>
    <ody:time_delay_integration_flag/>
  </ody:THEMIS_Instrument_Attributes>
  <ody:THEMIS_Image_Properties>
    <ody:image_id/>
    <ody:image_duration/>
    <ody:inst_compression_ratio/>
    <ody:focal_plane_temperature/>
    <ody:missing_scan_lines/>
    <ody:partial_scan_lines/>
    <ody:uncorrected_sclk_start_count/>
    <ody:image_description/>
    <ody:maximum_brightness_temperature/>
    <ody:minimum_brightness_temperature/>
  </ody:THEMIS_Image_Properties>
  <ody:GRS_Observation_Information>
    <ody:release_number/>
    <ody:product_type/>
    <ody:product_version_id/>
    <ody:mission_phase_name/>
    <ody:center_latitude/>
    <ody:start_solar_longitude/>
    <ody:stop_solar_longitude/>
    <ody:spacecraft_clock_start/>
    <ody:spacecraft_clock_stop/>
  </ody:GRS_Observation_Information>
</ody:ODY_Parameters>
</Mission_Area>
...
</Observation_Area>
```

The namespace for the 2001 Mars Odyssey Mission Data Dictionary is <http://pds.nasa.gov/pds4/mission/ody/v1>, abbreviated “ody:”.

ORGANIZATION OF CLASSES AND ATTRIBUTES

5.1 Class Organization

Below is a structured list showing the organization of classes, ordered by appearance in the PDS4 label. Each class name is linked to its complete definition in the *Definitions* section.

- *ODY_Parameters*
 - *THEMIS_Observation_Context*
 - *THEMIS_Instrument_Attributes*
 - *THEMIS_Image_Properties*
 - *GRS_Observation_Information*

5.2 Attributes by Class

The attributes immediately under each class (if any) are listed below. Both classes and attributes are ordered by appearance in the PDS4 label; however, each class is listed only once, even if that class can appear in more than one place in a PDS4 label. Each class and attribute name is linked to its complete definition in the *Definitions* section.

5.2.1 ODY_Parameters (attribute list)

- *product_type*
- *orbit_number*

5.2.2 THEMIS_Observation_Context (attribute list)

- *spacecraft_orientation_pitch*
- *spacecraft_orientation_roll*
- *spacecraft_orientation_yaw*
- *spacecraft_pointing_mode*

5.2.3 THEMIS_Instrument_Attributes (attribute list)

- *detector_id*
- *flight_software_version_id*
- *command_sequence_number*
- *spatial_summing*
- *interframe_delay*
- *exposure_duration*
- *inst_compression_name*
- *gain_number*
- *offset_number*
- *rice_flag*
- *time_delay_integration_flag*

5.2.4 THEMIS_Image_Properties (attribute list)

- *image_id*
- *image_duration*
- *inst_compression_ratio*
- *focal_plane_temperature*
- *missing_scan_lines*
- *partial_scan_lines*
- *uncorrected_sclk_start_count*
- *image_description*
- *maximum_brightness_temperature*
- *minimum_brightness_temperature*

5.2.5 GRS_Observation_Information (attribute list)

- *release_number*
- *product_type*
- *product_version_id*
- *mission_phase_name*
- *center_latitude*
- *start_solar_longitude*
- *stop_solar_longitude*
- *spacecraft_clock_start*
- *spacecraft_clock_stop*

DEFINITIONS

6.1 Classes (in alphabetical order)

6.1.1 GRS_Observation_Information

The GRS_Observation_Information class is the container for GRS-related metadata elements.

- *go to attribute list*
- Minimum occurrences: 0
- Maximum occurrences: 1

6.1.2 ODY_Parameters

The ODY_Parameters class is the container for mission-specific metadata elements.

- *go to attribute list*
- Minimum occurrences: 1
- Maximum occurrences: 1

6.1.3 THEMIS_Image_Properties

The THEMIS_Image_Properties class contains attributes specific to THEMIS images.

- *go to attribute list*
- Minimum occurrences: 0
- Maximum occurrences: 1

6.1.4 THEMIS_Instrument_Attributes

The THEMIS_Instrument_Attributes class contains attributes specific to the THEMIS instrument.

- *go to attribute list*
- Minimum occurrences: 0
- Maximum occurrences: 1

6.1.5 THEMIS_Observation_Context

The THEMIS_Observation_Context class contains attributes specific to THEMIS observations.

- *go to attribute list*
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2 Attributes (in alphabetical order)

6.2.1 *center_latitude*

Center latitude of the 5 degree latitude band of the summed gamma spectra dataset

- PDS4 data type: ASCII_Real
- Valid values: N/A
- Minimum value: -1.7976931348623157e+308
- Maximum value: 1.7976931348623157e+308
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.2 *command_sequence_number*

Numeric identifier for the sequence of commands sent to the Odyssey spacecraft which include this THEMIS observation.

- PDS4 data type: ASCII_Integer
- Valid values: N/A
- Minimum value: -9223372036854775808
- Maximum value: 9223372036854775807
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.3 *detector_id*

Abbreviated name of THEMIS camera used to collect this observation.

- PDS4 data type: ASCII_Short_String_Collapsed
- Valid values:
 - IR
 - * Description: Thermal Emission Imaging System Infrared instrument

– VIS

- * Description: Thermal Emission Imaging System Visible instrument
- Minimum Length: 1
- Maximum Length: 255
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.4 exposure_duration

The length of time the THEMIS VIS detector array is exposed per frame in an image.

- PDS4 data type: ASCII_Real
- Valid values: N/A
- Minimum value: -1.7976931348623157e+308
- Maximum value: 1.7976931348623157e+308
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.5 flight_software_version_id

The version of THEMIS instrument flight software used to acquire the observation.

- PDS4 data type: ASCII_Short_String_Collapsed
- Valid values: N/A
- Minimum Length: 1
- Maximum Length: 255
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.6 focal_plane_temperature

Temperature of the THEMIS VIS camera focal plane array at the time of the observation.

- PDS4 data type: ASCII_Real
- Valid values: N/A
- Minimum value: -1.7976931348623157e+308
- Maximum value: 1.7976931348623157e+308
- Nillable: No

- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.7 *gain_number*

The gain value of the THEMIS IR camera; a multiplicative factor used in the analog to digital conversion.

- PDS4 data type: ASCII_Integer
- Valid values: N/A
- Minimum value: -9223372036854775808
- Maximum value: 9223372036854775807
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.8 *image_description*

Description of the observation written by the THEMIS Mission Planner.

- PDS4 data type: ASCII_Short_String_Collapsed
- Valid values: N/A
- Minimum Length: 1
- Maximum Length: 255
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.9 *image_duration*

The length of time required to collect all frames of all bands in the downlinked image.

- PDS4 data type: ASCII_Real
- Valid values: N/A
- Minimum value: -1.7976931348623157e+308
- Maximum value: 1.7976931348623157e+308
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.10 *image_id*

Numeric identifier for this observation within the onboard command sequence.

- PDS4 data type: ASCII_Integer
- Valid values: N/A
- Minimum value: -9223372036854775808
- Maximum value: 9223372036854775807
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.11 *inst_compression_name*

The type of compression applied to the THEMIS VIS data onboard the spacecraft and removed before storage in the raw data file.

- PDS4 data type: ASCII_Short_String_Collapsed
- Valid values: N/A
- Minimum Length: 1
- Maximum Length: 255
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.12 *inst_compression_ratio*

The ratio of the size of the uncompressed data file to the compressed data file.

- PDS4 data type: ASCII_Real
- Valid values: N/A
- Minimum value: -1.7976931348623157e+308
- Maximum value: 1.7976931348623157e+308
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.13 *interframe_delay*

The time between successive frames of a THEMIS VIS observation.

- PDS4 data type: ASCII_Real
- Valid values: N/A
- Minimum value: -1.7976931348623157e+308
- Maximum value: 1.7976931348623157e+308
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.14 *maximum_brightness_temperature*

Maximum brightness temperature value measured within the image.

- PDS4 data type: ASCII_Real
- Valid values: N/A
- Minimum value: -1.7976931348623157e+308
- Maximum value: 1.7976931348623157e+308
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.15 *minimum_brightness_temperature*

Minimum brightness temperature value measured within the image.

- PDS4 data type: ASCII_Real
- Valid values: N/A
- Minimum value: -1.7976931348623157e+308
- Maximum value: 1.7976931348623157e+308
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.16 *missing_scan_lines*

The total number of scan lines missing from a THEMIS IR image when it was received at Earth.

- PDS4 data type: ASCII_Integer
- Valid values: N/A
- Minimum value: -9223372036854775808
- Maximum value: 9223372036854775807
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.17 *mission_phase_name*

The mission_phase_name attribute provides the mission-defined name of a time period within the mission.

- PDS4 data type: ASCII_Short_String_Collapsed
- Valid values:
 - AEROBRAKING
 - * Description: ODY Aerobraking mission phase: 2001-10-28 thru 2002-02-17
 - CRUISE
 - * Description: ODY Cruise mission phase: 2001-04-07 thru 2001-10-22
 - EXTENDED MISSION
 - * Description: ODY Extended Mission phases: 2004-10-01 to present
 - MAPPING
 - * Description: ODY Mapping mission phase: 2002-02-18 thru 2004-09-30
 - ORBIT INSERTION
 - * Description: ODY Orbit Insertion mission phase: 2001-10-23 thru 2001-10-27
- Minimum Length: 1
- Maximum Length: 255
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.18 *offset_number*

The offset value of the THEMIS IR camera; the offset value multiplied by a constant voltage is added to the measured voltage in the analog to digital conversion.

- PDS4 data type: ASCII_Integer
- Valid values: N/A
- Minimum value: -9223372036854775808
- Maximum value: 9223372036854775807
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.19 *orbit_number*

The orbit_number attribute identifies the orbit number when the observation was taken.

- PDS4 data type: ASCII_NonNegative_Integer
- Valid values: N/A
- Minimum value: 0
- Maximum value: 18446744073709551615
- Regex Pattern: [0-9]+
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.20 *partial_scan_lines*

The number of lines in a summed THEMIS IR image which were produced by averaging less than N lines of the original non-summed image, where N is the value of the spatial_summing keyword. Value of N/A used for spatial_summing=1.

- PDS4 data type: ASCII_Short_String_Collapsed
- Valid values: N/A
- Minimum Length: 1
- Maximum Length: 255
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.21 *product_type*

The product_type attribute identifies the type of data product.

- PDS4 data type: ASCII_Short_String_Collapsed
- Valid values:
 - AVERAGED_HEND_DATA
 - * Description: Averaged HEND Data products are composed of averaged normalized counting rates, orbital neutron fluxes and the associated timing, spatial and engineering information.
 - AVERAGED_NEUTRON_DATA
 - * Description: The AND product contains average fluxes for epithermal, thermal, and fast neutrons.
 - CDR
 - * Description: Calibrated Data Record
 - CHAN_DATA
 - * Description: GRS Chan Data
 - COMMAND_LIST
 - * Description: GRS Command List
 - CORRECTED_GAMMA_SPECTRA
 - * Description: Corrected gamma ray spectra with associated data.
 - DDR
 - * Description: Derived Data Record
 - DERIVED_HEND_DATA
 - * Description: Derived HEND data are composed of raw counts, a background component, background subtracted counts and the associated timing and spatial information.
 - DERIVED_NEUTRON_DATA
 - * Description: The DND product contains normalized neutron counting rates for all four of the Neutron Spectrometer prisms, from which thermal and epithermal neutron count rates are determined.
 - EDR
 - * Description: Experiment Data Record
 - ENG_DATA
 - * Description: GRS Engineering Data
 - E_KERNEL
 - * Description: GRS E Kernel Data
 - GAMMA_SPECTRA
 - * Description: This the raw uncalibrated gamma ray spectra and associated data.
 - GRS_SPECIAL
 - * Description: GRS Special, one-off table.
 - HEND_SPECTRA
 - * Description: The raw uncalibrated hend spectra and associated data

- MESSAGE_LOG
 - * Description: GRS Message Log
 - NEUTRON_SPECTRA
 - * Description: The raw uncalibrated neutron detector counts and associated data
 - PROFILE_DATA
 - * Description: Profile spectra and associated data.
 - PULSER_SPECTRA
 - * Description: Pulser spectrum and associated data.
 - RDR
 - * Description: Reduced Data Record
 - SUMMED_GAMMA_SPECTRA
 - * Description: Sums of corrected gamma spectra with ancillary data.
- Minimum Length: 1
 - Maximum Length: 255
 - Nillable: No
 - Minimum occurrences: 0
 - Maximum occurrences: 1

6.2.22 product_version_id

The product_version_id element identifies the version of an individual data product.

- PDS4 data type: ASCII_Short_String_Collapsed
- Valid values: N/A
- Minimum Length: 1
- Maximum Length: 255
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.23 release_number

release_number is the identifier of a scheduled release of ODY data from PDS. The first ODY data release has release_number “0001”. The release_number for a given product is always the first release in which it appears, and does not change if the product is revised later.

- PDS4 data type: ASCII_Short_String_Collapsed
- Valid values: N/A
- Minimum Length: 1
- Maximum Length: 255

- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.24 *rice_flag*

Status of onboard lossless compression algorithm applied before downlinking the THEMIS IR observation and removed before storage in the raw data file.

- PDS4 data type: ASCII_Short_String_Collapsed
- Valid values:
 - Disabled
 - * Description: onboard lossless compression was disabled
 - Enabled
 - * Description: onboard lossless compression was enabled
- Minimum Length: 1
- Maximum Length: 255
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.25 *spacecraft_clock_start*

The *spacecraft_clock_start_count* attribute provides the value of the spacecraft clock at the beginning of a time period of interest.

- PDS4 data type: ASCII_Short_String_Collapsed
- Valid values: N/A
- Minimum Length: 1
- Maximum Length: 255
- Regex Pattern: [0-9]{12}
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.26 *spacecraft_clock_stop*

The *spacecraft_clock_stop_count* attribute provides the value of the spacecraft clock at the end of a time period of interest.

- PDS4 data type: ASCII_Short_String_Collapsed
- Valid values: N/A
- Minimum Length: 1
- Maximum Length: 255
- Regex Pattern: [0-9]{12}
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.27 *spacecraft_orientation_pitch*

Odyssey spacecraft pitch orientation during this observation.

- PDS4 data type: ASCII_Real
- Valid values: N/A
- Minimum value: -1.7976931348623157e+308
- Maximum value: 1.7976931348623157e+308
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.28 *spacecraft_orientation_roll*

Odyssey spacecraft roll orientation during this observation.

- PDS4 data type: ASCII_Real
- Valid values: N/A
- Minimum value: -1.7976931348623157e+308
- Maximum value: 1.7976931348623157e+308
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.29 *spacecraft_orientation_yaw*

Odyssey spacecraft yaw orientation during this observation.

- PDS4 data type: ASCII_Real
- Valid values: N/A
- Minimum value: -1.7976931348623157e+308
- Maximum value: 1.7976931348623157e+308
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.30 *spacecraft_pointing_mode*

Description of the Odyssey spacecraft pointing mode during this observation; see ODY_ORIENT_POINTING.txt for definitions of valid modes.

- PDS4 data type: ASCII_Short_String_Collapsed
- Valid values: N/A
- Minimum Length: 1
- Maximum Length: 255
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.31 *spatial_summing*

Onboard spatial average of NxN set of pixels, where N is the value of the keyword. A SPATIAL_SUMMING value equal to 1 indicates that no spatial averaging has been applied to the observation.

- PDS4 data type: ASCII_Integer
- Valid values: N/A
- Minimum value: -9223372036854775808
- Maximum value: 9223372036854775807
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.32 *start_solar_longitude*

Solar longitude (Ls) at the beginning of the observation period

- PDS4 data type: ASCII_Real
- Valid values: N/A
- Minimum value: -1.7976931348623157e+308
- Maximum value: 1.7976931348623157e+308
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.33 *stop_solar_longitude*

Solar longitude (Ls) at the end of the observation period

- PDS4 data type: ASCII_Real
- Valid values: N/A
- Minimum value: -1.7976931348623157e+308
- Maximum value: 1.7976931348623157e+308
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.34 *time_delay_integration_flag*

Status of onboard algorithm which applies a temporal average of successive lines in an IR image. When enabled, THEMIS TDI averages 16 detector rows to equal one line in an IR image.

- PDS4 data type: ASCII_Short_String_Collapsed
- Valid values:
 - Disabled
 - * Description: temporal average of successive lines was disabled
 - Enabled
 - * Description: temporal average of successive lines was enabled
- Minimum Length: 1
- Maximum Length: 255
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

6.2.35 *uncorrected_sclk_start_count*

The spacecraft clock value when the THEMIS instrument was commanded to acquire an observation. This can differ from the SPACECRAFT_CLOCK_START_COUNT (or the other START_TIME keywords) by as much as 4 seconds, depending on which bands are acquired in the observation.

- PDS4 data type: ASCII_Real
- Valid values: N/A
- Minimum value: -1.7976931348623157e+308
- Maximum value: 1.7976931348623157e+308
- Nillable: No
- Minimum occurrences: 0
- Maximum occurrences: 1

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EXAMPLES

Example PDS4 label snippet from urn:nasa:pds:ody.themis.geo:data_visgeo:va3000009eqr::2.0:

```
<Mission_Area>
  ...
<ody:ODY_Parameters>
  <ody:THEMIS_Observation_Context>
    <ody:spacecraft_orientation_pitch unit="deg">0</ody:spacecraft_orientation_pitch>
    <ody:spacecraft_orientation_roll unit="deg">0</ody:spacecraft_orientation_roll>
    <ody:spacecraft_orientation_yaw unit="deg">0</ody:spacecraft_orientation_yaw>
    <ody:spacecraft_pointing_mode>NADIR</ody:spacecraft_pointing_mode>
  </ody:THEMIS_Observation_Context>
  <ody:THEMIS_Instrument_Attributes>
    <ody:detector_id>VIS</ody:detector_id>
    <ody:spatial_summing>4</ody:spatial_summing>
    <ody:interframe_delay unit="s">0.800</ody:interframe_delay>
    <ody:exposure_duration unit="ms">3.100</ody:exposure_duration>
  </ody:THEMIS_Instrument_Attributes>
  <ody:THEMIS_Image_Properties>
    <ody:image_id>9</ody:image_id>
    <ody:image_duration unit="s">65.600</ody:image_duration>
    <ody:focal_plane_temperature unit="K">-5.54</ody:focal_plane_temperature>
    <ody:uncorrected_sclk_start_count unit="s">1425541531.025</ody:uncorrected_sclk_
    start_count>
    <ody:image_description>No Description Given</ody:image_description>
  </ody:THEMIS_Image_Properties>
</ody:ODY_Parameters>
</Mission_Area>
```

Example PDS4 label snippet from urn:nasa:pds:odyssey_grs_and:data_science_averaged:and_13_090_105::1.0:

```
<Mission_Area>
<ody:ODY_Parameters>
  <ody:GRS_Observation_Information>
    <ody:release_number>94</ody:release_number>
    <ody:product_type>AVERAGED_NEUTRON_DATA</ody:product_type>
    <ody:product_version_id>1.0</ody:product_version_id>
    <ody:mission_phase_name>EXTENDED MISSION</ody:mission_phase_name>
    <ody:start_solar_longitude unit="deg">090</ody:start_solar_longitude>
    <ody:stop_solar_longitude unit="deg">105</ody:stop_solar_longitude>
    <ody:spacecraft_clock_start>366856032361</ody:spacecraft_clock_start>
    <ody:spacecraft_clock_stop>367608058563</ody:spacecraft_clock_stop>
```

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```
</ody:GRS_Observation_Information>
</ody:ODY_Parameters>
</Mission_Area>
```

Example PDS4 label snippet from urn:nasa:pds:ody.themis.sdp:browse_sdp:ia4000002bws::1.0:

```
<Mission_Area>
  ...
  <ody:ODY_Parameters>
    <ody:THEMIS_Observation_Context>
      <ody:spacecraft_orientation_pitch unit="deg">0</ody:spacecraft_orientation_pitch>
      <ody:spacecraft_orientation_roll unit="deg">0</ody:spacecraft_orientation_roll>
      <ody:spacecraft_orientation_yaw unit="deg">0</ody:spacecraft_orientation_yaw>
      <ody:spacecraft_pointing_mode>NADIR</ody:spacecraft_pointing_mode>
    </ody:THEMIS_Observation_Context>
    <ody:THEMIS_Instrument_Attributes>
      <ody:detector_id>IR</ody:detector_id>
      <ody:command_sequence_number>104000</ody:command_sequence_number>
      <ody:spatial_summing>1</ody:spatial_summing>
      <ody:gain_number>16</ody:gain_number>
      <ody:offset_number>4</ody:offset_number>
      <ody:time_delay_integration_flag>Enabled</ody:time_delay_integration_flag>
    </ody:THEMIS_Instrument_Attributes>
    <ody:THEMIS_Image_Properties>
      <ody:image_id>2</ody:image_id>
      <ody:image_duration unit="s">120.000</ody:image_duration>
      <ody:missing_scan_lines>12031</ody:missing_scan_lines>
      <ody:uncorrected_sclk_start_count unit="s">1432655021.204</ody:uncorrected_sclk_
      start_count>
      <ody:image_description>No Description Given</ody:image_description>
    </ody:THEMIS_Image_Properties>
  </ody:ODY_Parameters>
</Mission_Area>
```

Example PDS4 label snippet from urn:nasa:pds:odyssey_grs_sgs:data_science_derived:sgs_04_270_285_00::1.0:

```
<Mission_Area>
  <ody:ODY_Parameters>
    <ody:GRS_Observation_Information>
      <ody:release_number>0030</ody:release_number>
      <ody:product_type>SUMMED_GAMMA_SPECTRA</ody:product_type>
      <ody:product_version_id>1.0</ody:product_version_id>
      <ody:mission_phase_name>EXTENDED MISSION</ody:mission_phase_name>
      <ody:center_latitude unit="deg">87.5</ody:center_latitude>
      <ody:start_solar_longitude unit="deg">270</ody:start_solar_longitude>
      <ody:stop_solar_longitude unit="deg">285</ody:stop_solar_longitude>
      <ody:spacecraft_clock_start>237420828581</ody:spacecraft_clock_start>
      <ody:spacecraft_clock_stop>237499179581</ody:spacecraft_clock_stop>
    </ody:GRS_Observation_Information>
  </ody:ODY_Parameters>
</Mission_Area>
```

**CHAPTER
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EDIT HISTORY

See also: [ODY change log](#).
2026-01-20 Jennifer Ward