PDS4 Galileo Local Mission Dictionary Users' Guide

Small Bodies Node

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1 Introduction

The Galileo mission dictionary was created by the PDS Small Bodies Node in support of migrating Galileo data from PDS3 to PDS4.

1.1 Purpose of this Users' Guide

The users' guide is intended to provide help in using the Galileo mission dictionary to include metadata specific to Galileo migrated data in PDS4 Product_Observational labels.

1.2 Audience

This user's guide is for anyone migrating or using PDS Galileo data. Familiarity with basic PDS4 concepts is helpful.

1.3 Applicable Documents

PDS4 Standards Reference: https://pds.nasa.gov/datastandards/documents/sr/
PDS4 Information Model: https://pds.nasa.gov/datastandards/documents/im/

2 Overview of the Galileo Mission Data Dictionary

Galileo is intended to provide classes and attributes for metadata specific to migrated Galielo data. The Small Bodies Node holds the stewardship of Galileo, with Jesse Stone (jstone@psi.edu) and Beatrice Mueller (mueller@psi.edu) as the current points of contact.

Section 3 of this Guide covers how to include the classes and attributes of the dictionary in a PDS label file. Section 4 goes into more detail on the structure of the classes and attributes and how they are intended to be used. See section 5 for detailed specifications of each class and attribute.

3 How to Include the Galileo Dictionary in a PDS4 Label

3.1 Mission Dictionary Files

PDS4 dictionaries appear in several forms, typically having the same filename with different extensions. It can either be an ingest file, or a schema file coupled with a schematron file. The ingest file, with xml extension, is used for authoring the dictionary and often for ingesting it into tools, while the schema (.xsd) and schematron (.sch) files, which are compiled from the ingest file, are used to actually validate a product label. For released dictionaries, all these can be obtained from the PDS4 released schema page at https://pds.nasa.gov/datastandards/schema/released/.

3.2 Including the schema file in a label

In order to use the schema file, the Product_Observational element of your product label will need to have references to the dictionary added to it, as follows (for IM 1.23.0.0):

```
<Product_Observational
   xmlns="http://pds.nasa.gov/pds4/pds/v1"
   xmlns:galileo="http://pds.nasa.gov/pds4/mission/galileo/v1"
   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
   xsi:schemaLocation="http://pds.nasa.gov/pds4/pds/v1
      https://pds.nasa.gov/pds4/pds/v1/PDS4_PDS_1N00.xsd
      http://pds.nasa.gov/pds4/mission/galileo/v1
      https://pds.nasa.gov/pds4/mission/galileo/v1/
PDS4_GALILEO_1N00_1000.xsd”>
```

This example assumes that the galileo dictionary is the only dictionary in your label. If you have multiple dictionaries, you will need to make other modifications.

3.3 Including the schematron in a label

In order to use the schematron file, the xml prolog of your product label will need to have references to the dictionary added to it, as follows:

```
<?xml-model
href=“https://pds.nasa.gov/pds4/mission/galileo/v1/
PDS4_GALILEO_1N00_1000.xsd”
schematypens=“http://purl.oclc.org/dsdl/schematron”?
```

3.4 Including the mission dictionary elements

The data dictionary defines XML elements that can be used in a `Mission_Area`. A minimal example of the discipline area follows. A more detailed example for each class is given in the later sections of this Guide.

<Mission_Area>
 <galileo:Galileo>
  <galileo:Observation_Information>
   <galileo:observation_type>NIMS FULL MAP</galileo:observation_type>
  </galileo:Observation_Information>
 </galileo:Galileo>
</Mission_Area>

4 Organization of Classes and Attributes

The overall organization of classes and attributes for all of Galileo is shown in Figure 1. The dictionary contains two classes: Observation_Information and Geometry.

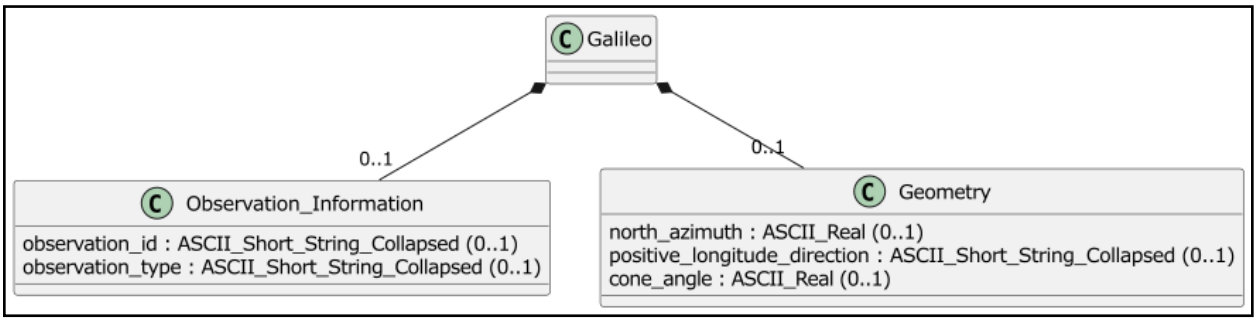

Figure 1: Organization of classes and attributes in the Galileo dictionary

4.1 The Observation_Information Class

Specifies observation information.

For example:

```
<galileo:Galileo>
   …
  <galileo:Observation_Information>
   <galileo:observation_id>IDUNIDACHM01A<galileo:observation_id>
  </galileo:Observation_Information>
</galileo:Galileo>
```

4.2 The Geometry Class

Specifies geometry information for Galileo data.

For example:

```
<galileo:Galileo>
   …
  <galileo:Geometry>
   <galileo:cone_angle unit="deg">156<cone_angle>
  </galileo:Geometry>
</galileo:Galileo>
```

5 Definitions

Galileo — class

This class specifies the parameters for migrated Galileo data.

Member of: Mission_Area

Cardinality: Single, Required

Members:

- Geometry
- Observation_Information

Geometry — class

This class specifies observation information.

Member of: Galileo

Cardinality: Single, Optional

Members:

- cone_angle
- north_azimuth
- positive_longitude_direction

Observation_Information — class

Specifies geometry information.

Member of: Galileo

Cardinality: Single, Optional

Members:

- observation_id
- observation_type

cone_angle — attribute

Specifies the cone angle, which is the value of the angle between the primary spacecraft axis and the pointing direction of the instrument.

Member of: Geometry

Cardinality: Single, Optional

Data Type: Real

Rules:

- the unit must be one of the following values: 'arcmin', 'arcsec', 'deg', 'hr', 'microrad', 'mrad', 'rad'

north_azimuth — attribute

Specifies the value of the angle between a line from the image center to the north pole and a reference line in the image plane. The reference line is a horizontal line from the image center to the middle right edge of the image. This angle increases in a clockwise direction..

Member of: Geometry

Cardinality: Single, Optional

Data Type: Real

Rules:

- the unit must be one of the following values: 'arcmin', 'arcsec', 'deg', 'hr', 'microrad', 'mrad', 'rad'

positive_longitude_direction — attribute

Identifies the direction of longitude (e.g. EAST, WEST) for a planet. The IAU definition for direction of positive longitude is adopted. Typically, for planets with prograde rotations, positive longitude direction is to the WEST. For planets with retrograde rotations, positive longitude direction is to the EAST. Note that the

positive_longitude_direction keyword should be used for planetographic systems, but not for planetocentric.

Member of: Geometry

Cardinality: Single, Optional

Data Type: String

Rules:

- the values have to be either ‘WEST’ or ‘EAST’

observation_id — attribute

Uniquely Specifies a scientific observation for the mission.

Member of: Observation_Information

Cardinality: Single, Optional

Data Type: String

observation_type — attribute

Specifies the type of observation.

Member of: Observation_Information

Cardinality: Single, Optional

Data Type: String

Rules:

- the values have to be one of the following: ‘NIMS SAFE’, ‘NIMS FULL MAP’, ‘NIMS FULL SPECTROMETER’, ‘NIMS LONG MAP’, ‘NIMS LONG SPECTROMETER’, ‘NIMS SHORT SPECTROMETER’, NIMS FIXED MAP’, ‘NIMS BAND EDGE MAP’, ‘NIMS BAND EDGE SPECTROMETER’, ‘NIMS STOP&SLIDE MAP’, ‘NIMS STOP&SLIDE SPECTROMETER’