PDS4 Radar Local Data Dictionary User's Guide

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Introduction

PREVIEW VERSION FOR TESTING ONLY. The Radar dictionary contains classes that support radar observations.

Purpose of this User's Guide

Audience

Applicable Documents

How to Include the Radar Local Data Dictionary in a PDS4 Label

Data Dictionary Files

There are several forms that a discipline dictionary can take. It can either be an ingest file, or a schema file coupled with a schematron file. The ingest file is used for authoring the dictionary, while the schema and schematron files, which are compiled from the ingest file, are used to actually validate a product label.

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:

```
<Product_Observational
   xmlns="http://pds.nasa.gov/pds4/pds/v1"
   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
   xmlns:radar="http://pds.nasa.gov/pds4/radar/v1"
   xsi:schemaLocation="http://pds.nasa.gov/pds4/pds/v1
      https://pds.nasa.gov/pds4/pds/v1/PDS4_PDS_1J00.xsd
      http://pds.nasa.gov/pds4/radar/v1
      https://pds.nasa.gov/pds4/radar/v1/PDS4_RADAR_1J00_1000.xsd">
```

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

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:

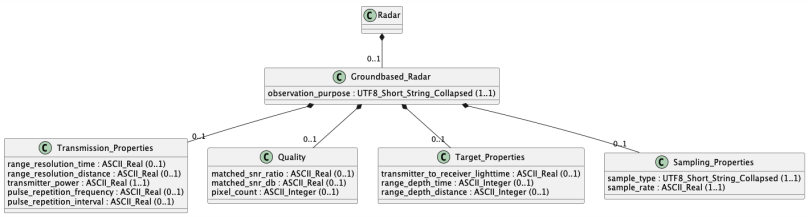
```
<?xml-model
    href="https://pds.nasa.gov/pds4/radar/v1/PDS4_RADAR_1J00_1000.xsd"

    schematypens="http://purl.oclc.org/dsdl/schematron"?>
```

Including the data dictionary elements

The data dictionary defines XML elements that can be used in a `Discipline_Area`. A minimal example of the discipline area follows:

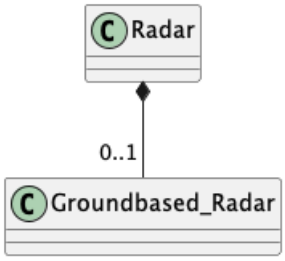
```
<Discipline_Area>
  <radar:Radar>
  </radar:Radar>
</Discipline_Area>
```

Organization of Classes and Attributes



Dictionary Diagram

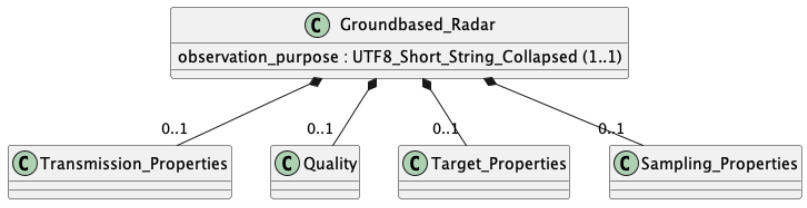
Radar



Radar

This class is the top level class that contains other radar classes, separated by sub-discipline.

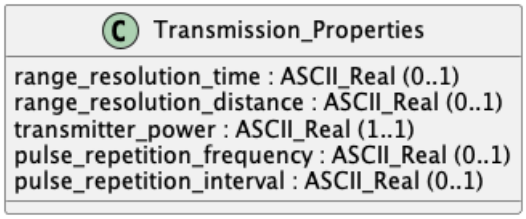
Groundbased_Radar



Groundbased_Radar

This class contains attributes that describe metadata pertinent to radar observations / data from Arecibo, Goldstone, and similar installations.

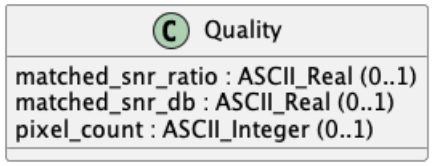
Transmission_Properties



Transmission_Properties

Transmission properties

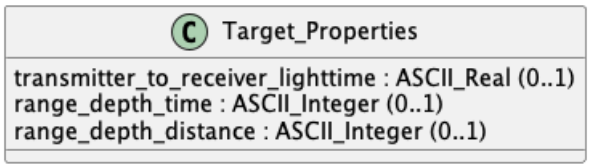
Quality



Quality

Quality

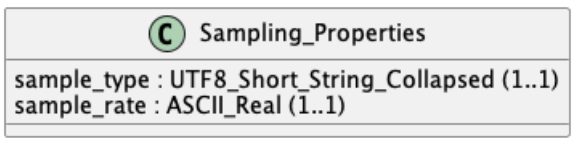
Target_Properties



Target_Properties

Target Properties

Sampling_Properties



Sampling_Properties

Sampling Properties

Definitions

Groundbased_Radar – class

This class contains attributes that describe metadata pertinent to radar observations / data from Arecibo, Goldstone, and similar installations.

matched_snr_db – attribute

total matched-filter signal-to-noise ratio in one run, expressed in db

matched_snr_ratio – attribute

total matched-filter signal-to-noise ratio in one run, expressed as an actual ratio

observation_purpose – attribute

Type of radar experiment being performed. Simpler experiments can have higher signal-to-noise or simpler hardware configurations, while more complicated experiments provide more information. ‘Range’ and ‘Total Power’ are mostly historical.

pixel_count – attribute

number of pixels in an image with measurable signal

pulse_repetition_frequency – attribute

For repeating waveforms including pulse patterns, the frequency at which the waveform or pulse pattern repeats.

pulse_repetition_interval – attribute

For repeating waveforms including pulse patterns, the interval from the beginning of one waveform or pulse pattern to the beginning of the next.

Quality – class

Quality

Radar – class

This class is the top level class that contains other radar classes, separated by sub-discipline.

range_depth_distance – attribute

Range depth in units of range_resolution. This is an indicator of observation usefulness for analysis

range_depth_time – attribute

Range depth in units of range_resolution. This is an indicator of observation usefulness for analysis

range_resolution_distance – attribute

Range resolution of products, expressed in units of distance. The minimum separation distance that can be resolved between two closely spaced targets by a radar.

range_resolution_time – attribute

Range resolution of products, expressed in units of time. The minimum separation distance that can be resolved between two closely spaced targets by a radar.

sample_rate – attribute

For a data acquisition system, the interval between the beginning of one time sample and the beginning of the next time sample.

sample_type – attribute

For a data acquisition system, whether the time samples are real values or complex value pairs obtained simultaneously. Does not imply a numeric format. Sample Type is whether the (usually voltage) samples are single real values or a complex number pair (a + ib), which depends on the hardware used to do it. In either case, the numbers themselves can be any numeric type. In raw form, they are usually few-bit integers or pairs of few-bit integers. But they may get converted to floating point in processing if filtering is done in software.

Sampling_Properties – class

Sampling Properties

Target_Properties – class

Target Properties

Transmission_Properties – class

Transmission properties

transmitter_power – attribute

transmitter power input to antenna

transmitter_to_receiver_lighttime – attribute

Distance from the transmitter, to the target, and back to the reciever at the time of observation, expressed as lighttime.

Examples