Archives 202

Prepare and understand your download

Practical Session

***Sébastien Besse**, ESA's Planetary Science Archive (PSA) Lead Scientist*

sbesse@sciops.esa.int

How to get the data you need

Objectives

1. Search for Rosetta/COSIMA datasets with a very specific science goal

2. Search for Chandrayaan-1 dataset and documentation

3. Use VESPA to search and visualize Saturn's aurora

What will you learn (hopefully)?

→ You can cross-combine tools to get what you need

→ You have to read the documentation, you will get nowhere without it!

Archives 202

Space Science Archives

Narrow-down COSIMA products

Obtaining COSIMA science products

Go to the Spice webgeocalc of NAIF to perform some computation

http://wgc.jpl.nasa.gov:8080/webgeocalc/#NewCalculation

Tell me when is the target available in the field of view after the mission wake-up?

What informations do you need?

- → Target in Field of View Finder
- → Rosetta, 67P/Churyumov-Gerasimenko, COSIMA
- → 20 Jan – 10 August 2014
- → Step of 1 day

Target in Field of View Finder

Find time intervals when a target intersects the space bounded by the field-of-view of an instrument.

Kernel selection: Rosetta

Instrument: ROS_COSIMA

Target: 67P/CHURYUMOV-GERASIMEN

Target shape: (•) Point ( ) Ellipsoid

Reference frame:

Observer: ROSETTA ORBITER

Input Time

Time system: UTC

Time format: Calendar date and time

Input times: (•) Single interval ( ) List of intervals

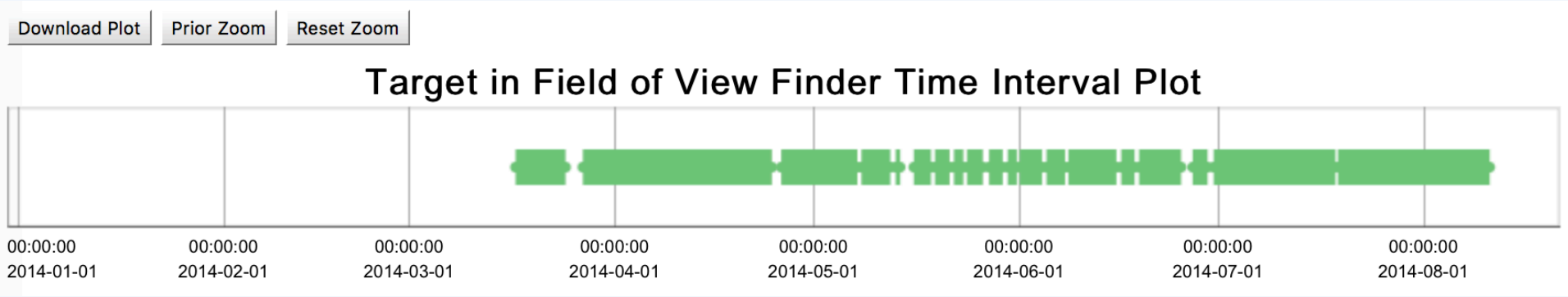
Start time: 2014 JAN 10

Stop time: 2014 AUG 11

Time step: 1 days

Obtaining COSIMA science products

Solutions : MARCH 17 !

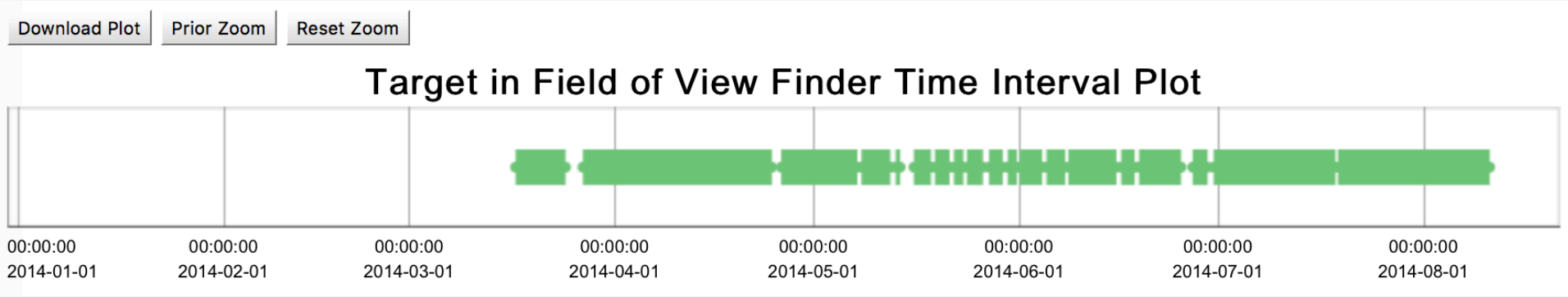


Now replace COSIMA by another instrument (e.g. ROSINA, OSIRIS, etc…)

Do you see any difference?

Obtaining COSIMA science products

Solutions : MARCH 17 !



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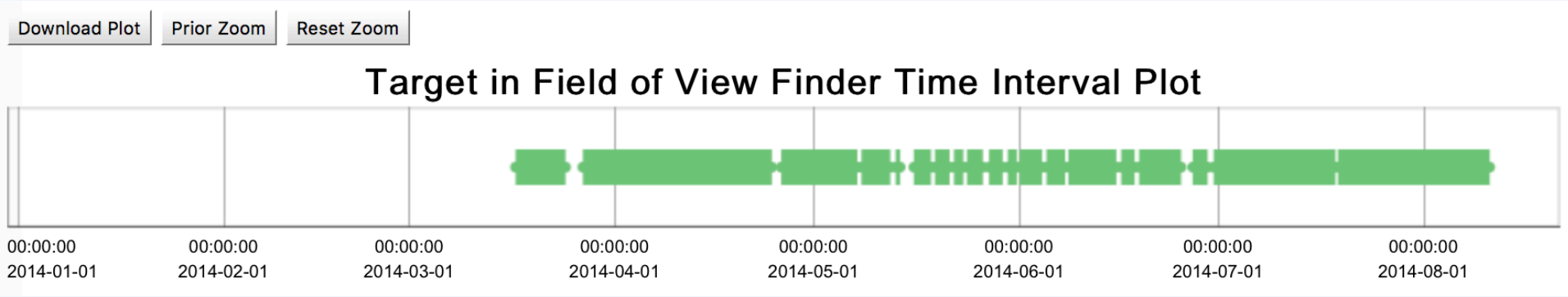
Wake-up is January 20, but I see data only in March. Why?

Obtaining COSIMA science products

Solutions : MARCH 17 !



Now replace COSIMA by another instrument (e.g. ROSINA, OSIRIS, etc…)

Do you see any difference?

Wake-up is January 20, but I see data only in March. Why?

Let's go to the PSA Archive: http://archives.esac.esa.int/npsa_test/

Find the older product of COSIMA from the Comet phase (target is 67P)

Obtaining COSIMA science products

Solutions

Wake-up is January 20, SPICE tell me I can get favorable conditions since March 17, but the first product is from July! Why?

Download the third product (*_GR__.tab).

What do you have?

Obtaining COSIMA science products

Solutions

Wake-up is January 20, SPICE tell me I can get favorable conditions since March 17, but the first product is from July! Why?

Download the third product.

What do you have?

```
OBJECT                          = FEATURE_TABLE
  NAME                          = FEATURES
  INTERCHANGE_FORMAT            = ASCII
  ROWS                          = 1268
  COLUMNS                       = 6
  ROW_BYTES                     = 37
  ^STRUCTURE                     = "COSISCOPE_GRAINS.FMT"
  DESCRIPTION                   = "COSISCOPE GENERATED LIST OF PROMINENT
                                   FEATURES IN THE SUBSTRATE IMAGE. THE
                                   SUBSTRATE HAS AREA OF 10000X10000
                                   MICROMETERS."
END_OBJECT                      = FEATURE_TABLE

END
   592,  8193,   592,  8193,  0, 14
   786,  8164,   800,  8192,  0, 32
   503,  7127,   531,  7154,105,  0
   546,  7459,   560,  7473, 12, 19
   711,  7153,   725,  7181, 30,  0
   266,  7003,   266,  7017, 11,  0
   363,  6878,   405,  6933,255, 87
   293,  6906,   293,  6906,  0, 12
   516,  7126,   517,  7140,  0, 19
   486,  6572,   486,  6572, 25,  0
   567,  6295,   581,  6308, 23,  0
   595,  6364,   623,  6405,255, 60
   277,  6379,   277,  6379,  0, 12
   498,  6212,   498,  6212,  0, 18
   440,  5852,   440,  5879, 16,  0
```

Obtaining COSIMA science products

Solutions

Wake-up is January 20, SPICE tell me I can get favorable conditions since March 17, but the first product is from July! Why?

Download the third product.

What do you have?

SPACE ARCHIVES is a complicated business, we can provide to the community only what the community is given us.

And you will often have to read pages of documentation! But this is faster then spending 5 years proposing your instrument, 10 years flying it to the comet…etc...

Archives 202

Space Science Archives

Looking at various datasets of Chandrayaan-1

Obtaining Moon Mineralogy Mapper science products

Here is the science case

I want to compare **reflectance calibrated** data of **Moon Mineralogy Mapper (M^3)** instrument onboard Chandrayaan-1 **with my own calibratio**n.

What do I need?

- Raw data to perform my own calibration
- Calibrated data so that I can compare to my own calibration
- PDS cartography and imaging node

→ Find Raw and Calibrated datasets of Moon Mineralogy Mapper (M^3)

Help: L0, L1, L2

You don't need to download the data.

Obtaining Moon Mineralogy Mapper science products

Solution

http://pds-imaging.jpl.nasa.gov/volumes/m3.html

Level 1 is radiance

Level 2 is reflectance

Obtaining Moon Mineralogy Mapper science products

Solution

http://pds-imaging.jpl.nasa.gov/volumes/m3.html

Level 1 is radiance

Level 2 is reflectance

However, here you have to search and download the file.

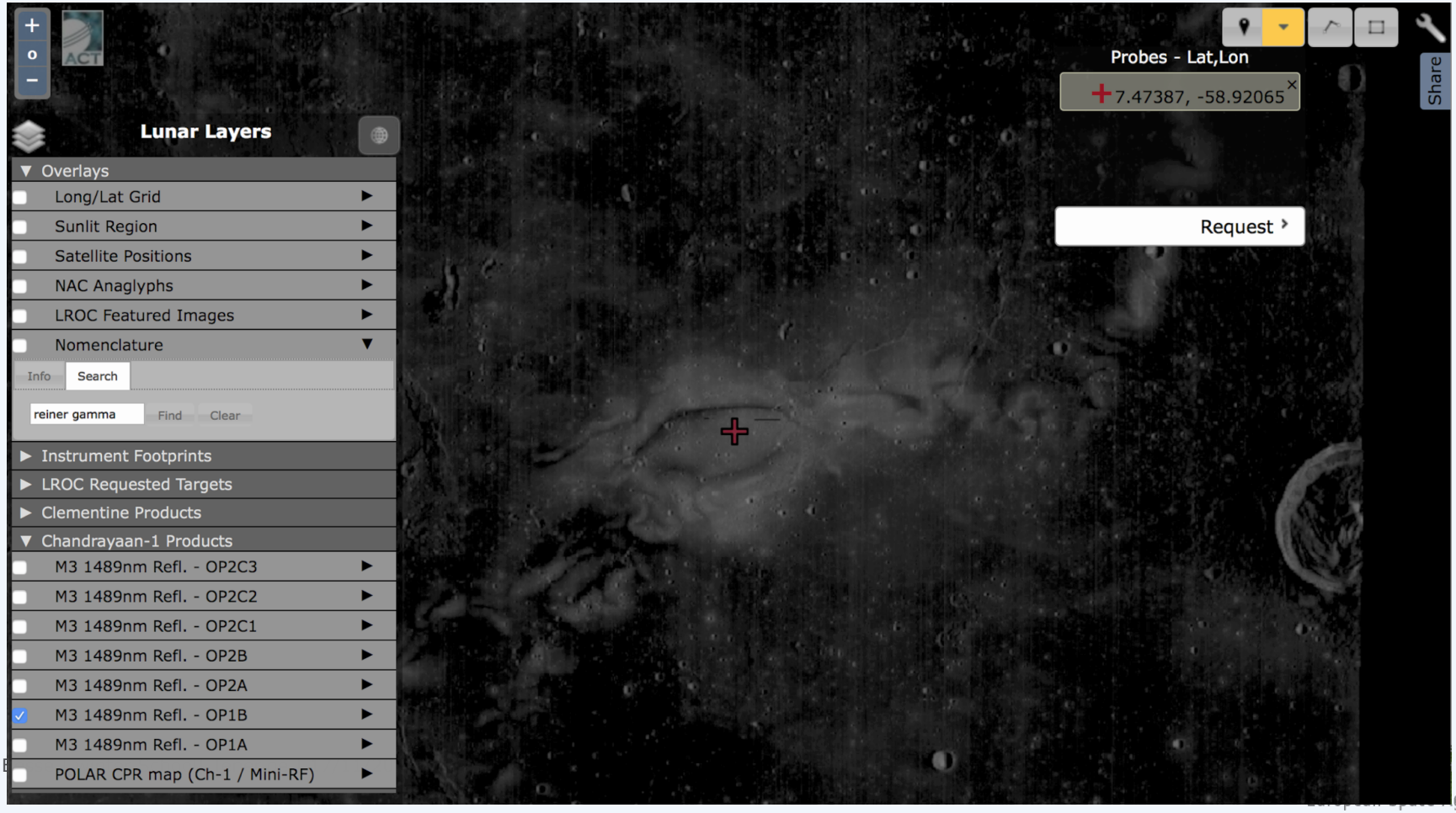
Go to **http://target.lroc.asu.edu/q3/#**

Search for M3 OP1B, Go to Reiner Gamma, Select a cross, and display the spectra of all Ops

Obtaining Moon Mineralogy Mapper science products

Solution

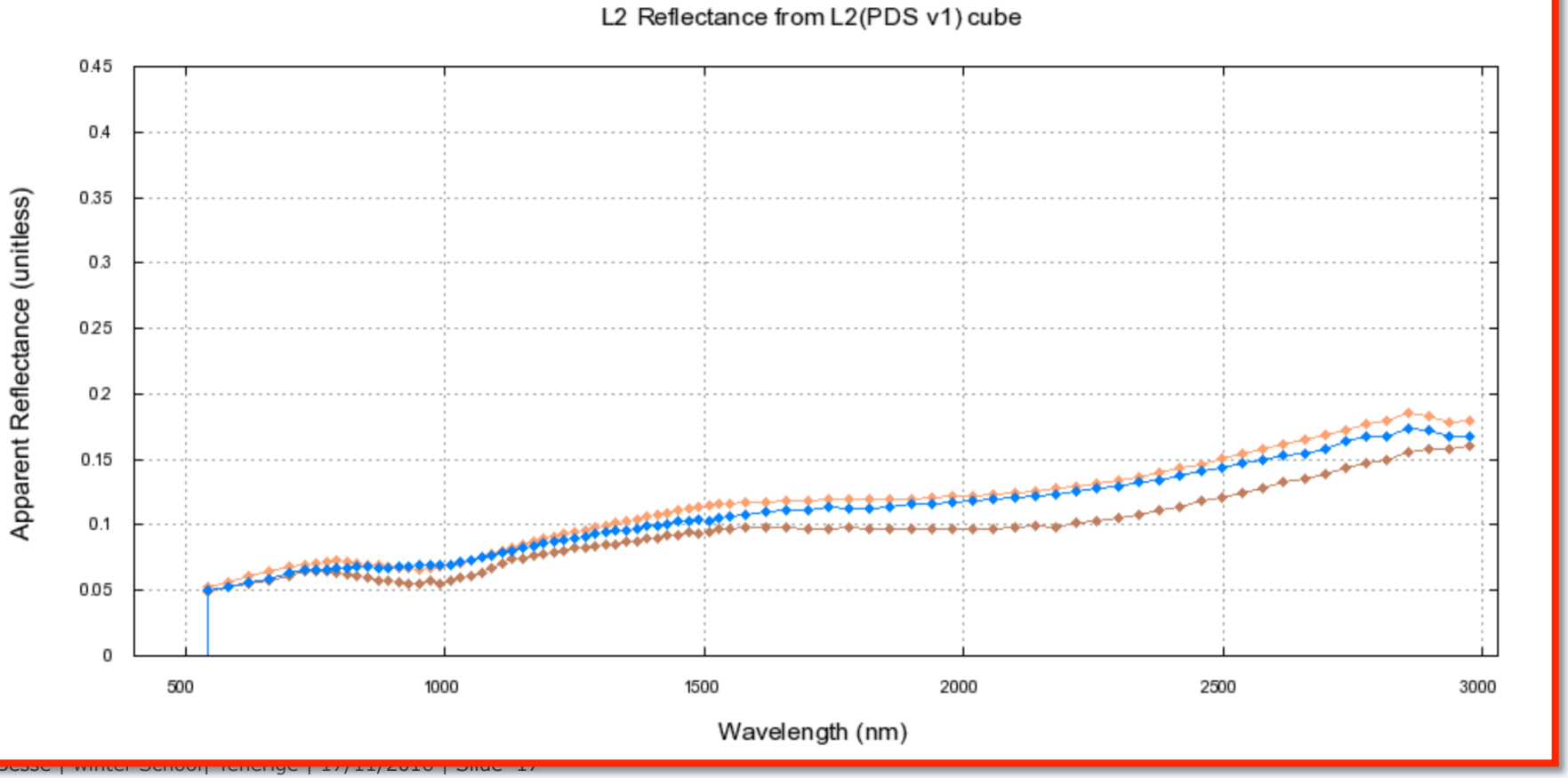
http://pds-imaging.jpl.nasa.gov/volumes/m3.html



Obtaining Moon Mineralogy Mapper science products

Solution

http://pds-imaging.jpl.nasa.gov/volumes/m3.html



Obtaining Moon Mineralogy Mapper science products

Solution

http://pds-imaging.jpl.nasa.gov/volumes/m3.html

Get the DPSIS document

http://pds-imaging.jpl.nasa.gov/data/m3/CH1M3_0004/DOCUMENT/DPSIS.PDF

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Am I doing the same?

Obtaining Moon Mineralogy Mapper science products

Solution

http://pds-imaging.jpl.nasa.gov/volumes/m3.html

Level 2, Step 1: Iπ/F Conversion

$$L2_{s1}(\lambda) = L1b(\lambda) * \pi / (SolarIrrad(\lambda) / d^2)$$

Level 2, Step 2: Statistical Polishing

$$L2_{s2}(\lambda) = L2_{s1}(\lambda) * g_{SP}(\lambda) + o_{SP}(\lambda))$$

Level 2, Step 3: Thermal Removal

$$L2_{s3}(\lambda) = F(L2_{s2}(\lambda))$$

$$L2_{s4}(\lambda) = L2_{s3}(\lambda) * \{ X_{L\_norm}(i\_topo, e\_topo, \alpha) * F_{alpha\_norm}(\alpha, \lambda) \}$$

Obtaining Moon Mineralogy Mapper science products

Solution

http://pds-imaging.jpl.nasa.gov/volumes/m3.html

Get the DPSIS document

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Am I doing the same?

Going to the documentation is KEY in most of the searches you will be doing.

Never be shy on that!

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Space Science Archives

Searching for Saturn aurora with VESPA

Obtaining Moon Mineralogy Mapper science products

Science case

I would like to search for other products about Saturn.

In particular, I am interested in Saturn's Aurora

Target is Saturn, and I want to look at images during this period of time:

Start time: 2014-05-25T06:02:43.266

Stop time: 2014-05-25T08:02:43.266

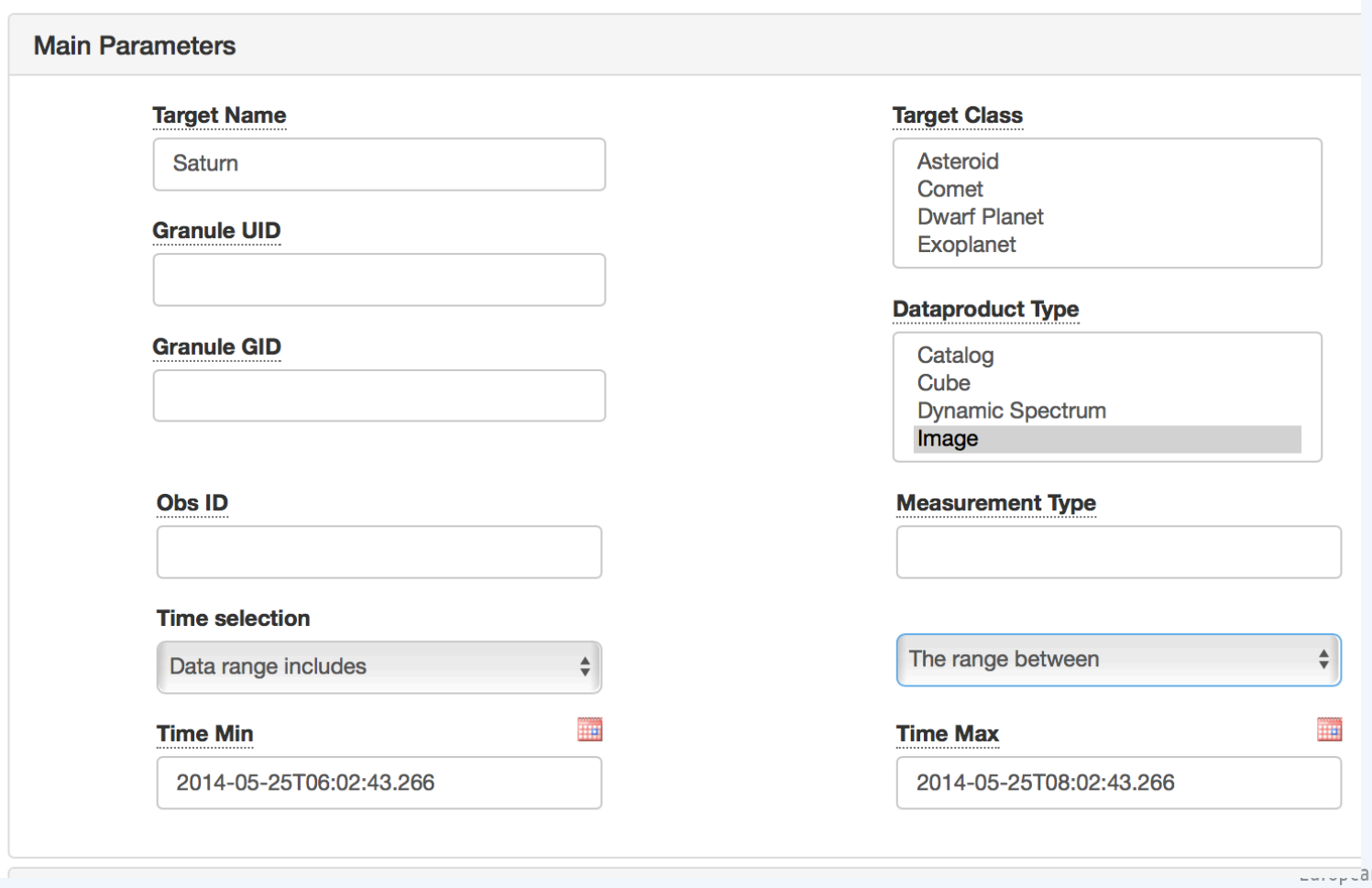
Search the VESPA client, and get those data!!

http://vespa.obspm.fr/planetary/data/epn/query/all/

Obtaining Moon Mineralogy Mapper science products

Solution

http://vespa.obspm.fr/planetary/data/epn/query/all/



Obtaining Moon Mineralogy Mapper science products

Solution

http://vespa.obspm.fr/planetary/data/epn/query/all/

Results in service APIS

Show 1000 entries

Column visibility | Show all | Hide all

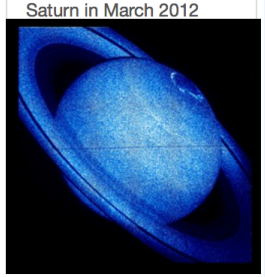
granule_uid	dataproduct_type	target_name	time_min (d)	time_max (d)	access_url
occgk5etq_x2d	image	Saturn	2014-05-25T07:38:17.251	2014-05-25T07:52:17.450	occgk5etq_x2d.fits
occgk5etq_proc_pdf	image	Saturn	2014-05-25T07:38:17.251	2014-05-25T07:52:17.450	occgk5etq_proc.pdf
occgk5etq_proc	image	Saturn	2014-05-25T07:38:17.251	2014-05-25T07:52:17.450	occgk5etq_proc.fits
occgk5etq_pol_s_pdf	image	Saturn	2014-05-25T07:38:17.251	2014-05-25T07:52:17.450	occgk5etq_pol_s.pdf
occgk5etq_pol_n_pdf	image	Saturn	2014-05-25T07:38:17.251	2014-05-25T07:52:17.450	occgk5etq_pol_n.pdf
occgk5etq_cyl_pdf	image	Saturn	2014-05-25T07:38:17.251	2014-05-25T07:52:17.450	occgk5etq_cyl.pdf
occgk5enq_x2d	image	Saturn	2014-05-25T07:04:04.259	2014-05-25T07:18:04.458	occgk5enq_x2d.fits
occgk5enq_proc_pdf	image	Saturn	2014-05-25T07:04:04.259	2014-05-25T07:18:04.458	occgk5enq_proc.pdf
occgk5enq_proc	image	Saturn	2014-05-25T07:04:04.259	2014-05-25T07:18:04.458	occgk5enq_proc.fits
occgk5enq_pol_s_pdf	image	Saturn	2014-05-25T07:04:04.259	2014-05-25T07:18:04.458	occgk5enq_pol_s.pdf
occgk5enq_pol_n_pdf	image	Saturn	2014-05-25T07:04:04.259	2014-05-25T07:18:04.458	occgk5enq_pol_n.pdf
occgk5enq_cyl_pdf	image	Saturn	2014-05-25T07:04:04.259	2014-05-25T07:18:04.458	occgk5enq_cyl.pdf
occgk5elq_x2d	image	Saturn	2014-05-25T06:02:43.266	2014-05-25T06:16:43.466	occgk5elq_x2d.fits
occgk5elq_proc_pdf	image	Saturn	2014-05-25T06:02:43.266	2014-05-25T06:16:43.466	occgk5elq_proc.pdf
occgk5elq_proc	image	Saturn	2014-05-25T06:02:43.266	2014-05-25T06:16:43.466	occgk5elq_proc.fits

Plotting tools

- TOPCAT
- Aladin
- SPLAT
- CASSIS
- 3DView

Example queries

Saturn in March 2012



S. E

Obtaining Moon Mineralogy Mapper science products

Solution

http://vespa.obspm.fr/planetary/data/epn/query/all/

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granule_uid	dataproduct_type	target_name	time_min (d)
occgk5etq_x2d	image	Saturn	2014-05-25T07:38:17.251
occgk5etq_proc_pdf	image	Saturn	2014-05-25T07:38:17.251
occgk5etq_proc	image	Saturn	2014-05-25T07:38:17.251
occgk5etq_pol_s_pdf	image	Saturn	2014-05-25T07:38:17.251
occgk5etq_pol_n_pdf	image	Saturn	2014-05-25T07:38:17.251
occgk5etq_cyl_pdf	image	Saturn	2014-05-25T07:38:17.251
occgk5enq_x2d	image	Saturn	2014-05-25T07:04:04.259
occgk5enq_proc_pdf	image	Saturn	2014-05-25T07:04:04.259
occgk5enq_proc	image	Saturn	2014-05-25T07:04:04.259
occgk5enq_pol_s_pdf	image	Saturn	2014-05-25T07:04:04.259
occgk5enq_pol_n_pdf	image	Saturn	2014-05-25T07:04:04.259
occgk5enq_cyl_pdf	image	Saturn	2014-05-25T07:04:04.259
occgk5elq_x2d	image	Saturn	2014-05-25T06:02:43.266
occgk5elq_proc_pdf	image	Saturn	2014-05-25T06:02:43.266
occgk5elq_proc	image	Saturn	2014-05-25T06:02:43.266