

TAP services for PSUP

IDOC - (Integrated Data and Operation Center)

IAS - (Institut d'Astrophysique Spatiale)

CNRS - (Centre national de la recherche scientifique)

Outline

- Context
 - PSUP - SITools2
 - VO Services
- DaCHS server for VESPA
 - VM idoc-dachs – config files on gitlab
- How to use
 - DaCHS Service Interface
 - VESPA Query Inteface
 - Aladin
 - TOPCAT

Context

SITools 2



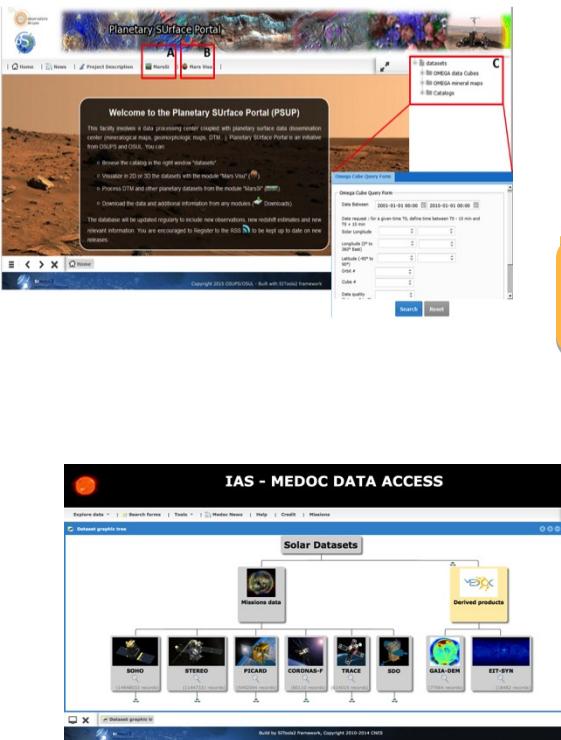
SITools2 is a CNES generic tool performed by a joint effort between CNES and scientific laboratories

- Java JEE Application
- Open source
- <https://github.com/SITools2/SITools2-core/projects>



- Plugins VO
- Astronomy Extension => Services VO
- <https://github.com/SITools2/Astronomy-Extension-Server>
- Used for ConeSearch and SIA in some of IDOC instances
- **No plugin for TAP service => use of DaCHS server**

SITools2 IDOC Instances

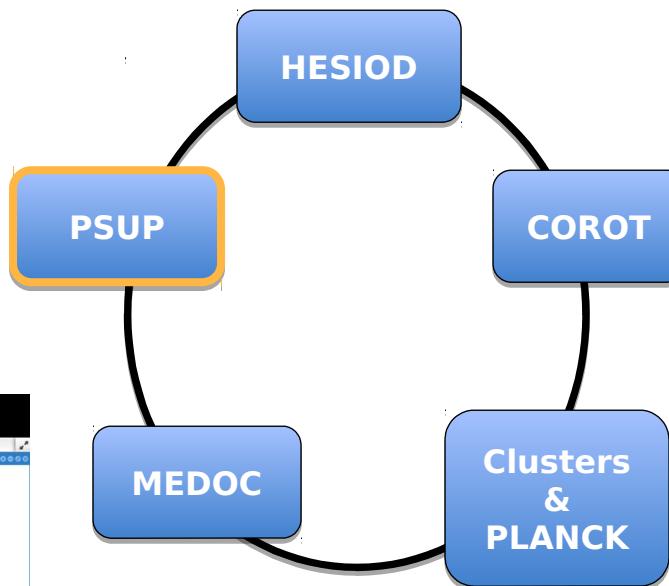


HESIOD: A screenshot of the HESIOD interface showing a grid of data cubes and a list of recent products.

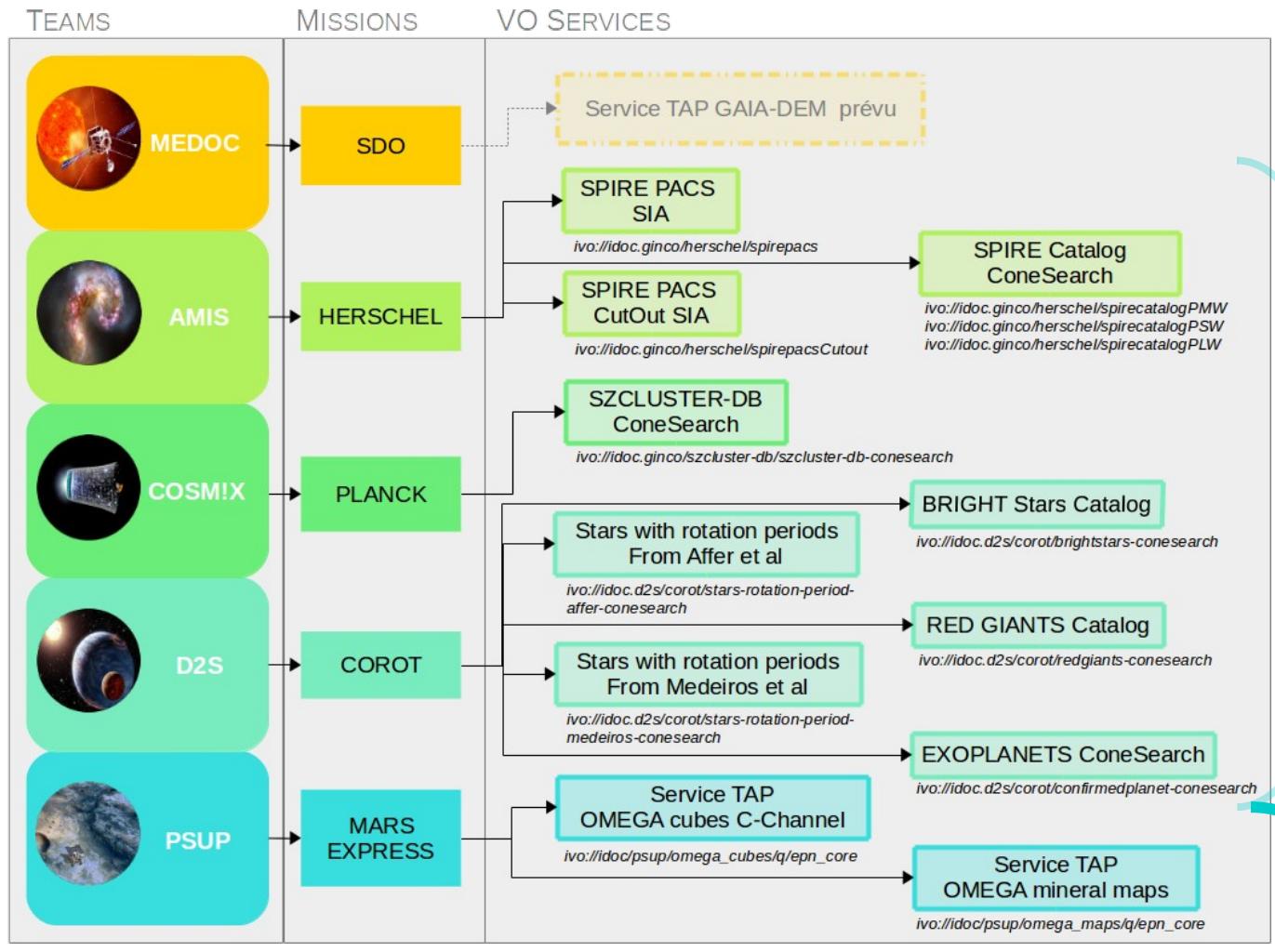
PSUP: A screenshot of the Planetary Surface Portal (PSUP) showing a Mars rover image and a search form for Omega Cube Query Form.

MEDOC: A screenshot of the IAS - MEDOC DATA ACCESS interface showing a tree structure of solar datasets.

SZ CLUSTER DATABASE: A screenshot of the SZ Cluster Database showing a list of clusters and their properties.



IDOC VO services summary



ConeSearch
And SIA services
Provided with
SITools2 plugins

TAP services
Provided with
DaCHS Server

DaCHS server for TAP service

DaCHS server for VESPA



DaCHS = GAVO Data Center Helper Suite

«The Data Center Helper Suite DaCHS is an integrated publication package for building VO and Web services, supporting the entire workflow from ingestion to data mapping to service definition. It implements all major data discovery, data access, and registry protocols defined by the VO» [\[doi:10.1016/j.ascom.2014.08.003\]](https://doi.org/10.1016/j.ascom.2014.08.003)



VESPA

VESPA = Virtual European Solar and Planetary Access

«VESPA (Virtual European Solar and Planetary Access) is an activity in the Europlanet 2020 Research Infrastructure programme funded under the European Commission's Horizon 2020 programme. It aims at building a Virtual Observatory for Planetary Science, connecting all sorts of data in the field, and providing modern tools to retrieve, cross-correlate, and display data and results of scientific analyses.»



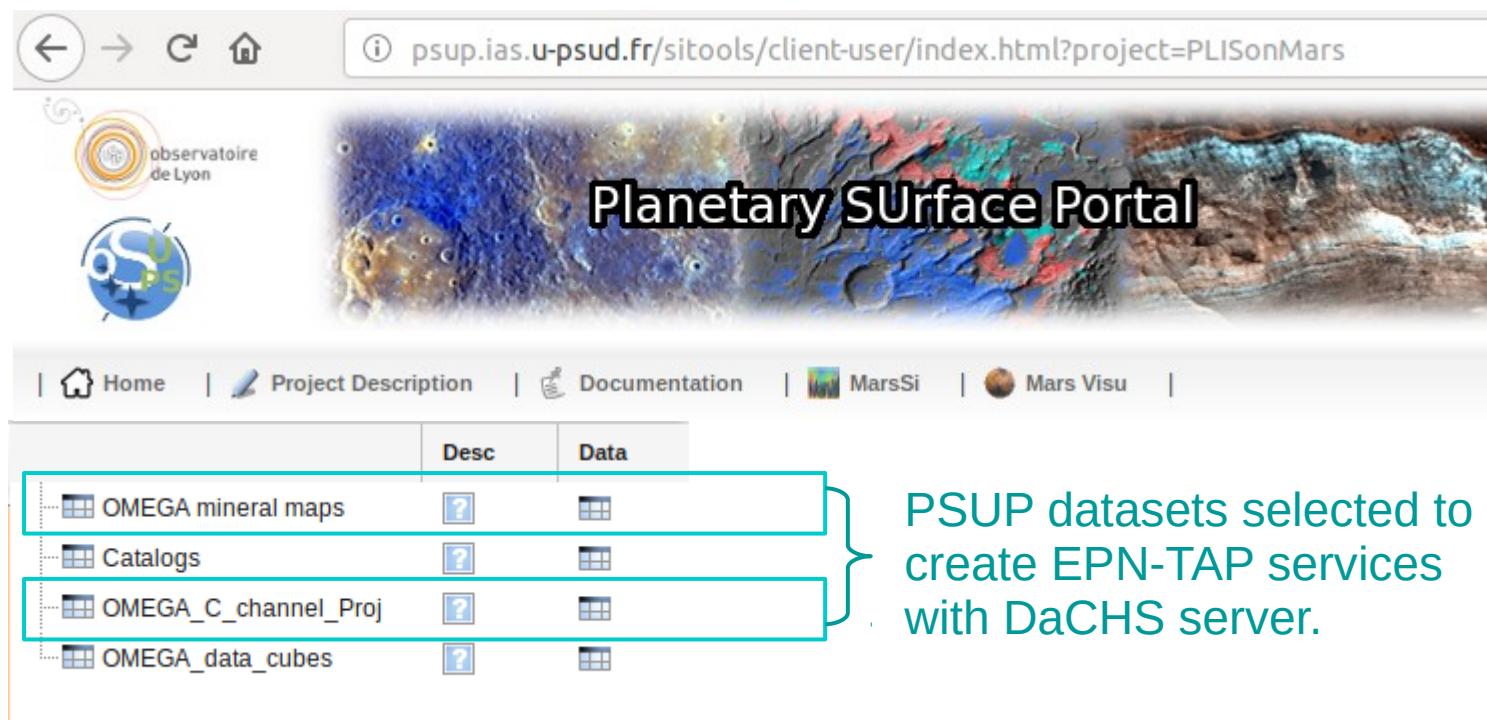
EPN-TAP = EuroPlaNet-Table Access Protocol

« A Data Access Protocol set up to search and retrieve Planetary Science data in general. This protocol will allow the user to select a subset of data from an archive in a standard way, based on the IVOA Table Access Protocol (TAP). » [\[doi:10.1016/j.ascom.2014.07.008\]](https://doi.org/10.1016/j.ascom.2014.07.008)

IDOC VM for DaCHS server

Creation of a Virtual Machine with DaCHS server following this [EPN-TAP tutorial](#) and attending [VESPA Workshop for data services in April 2018](#) in Prague.

Configuration of DaCHS services for two PSUP datasets :

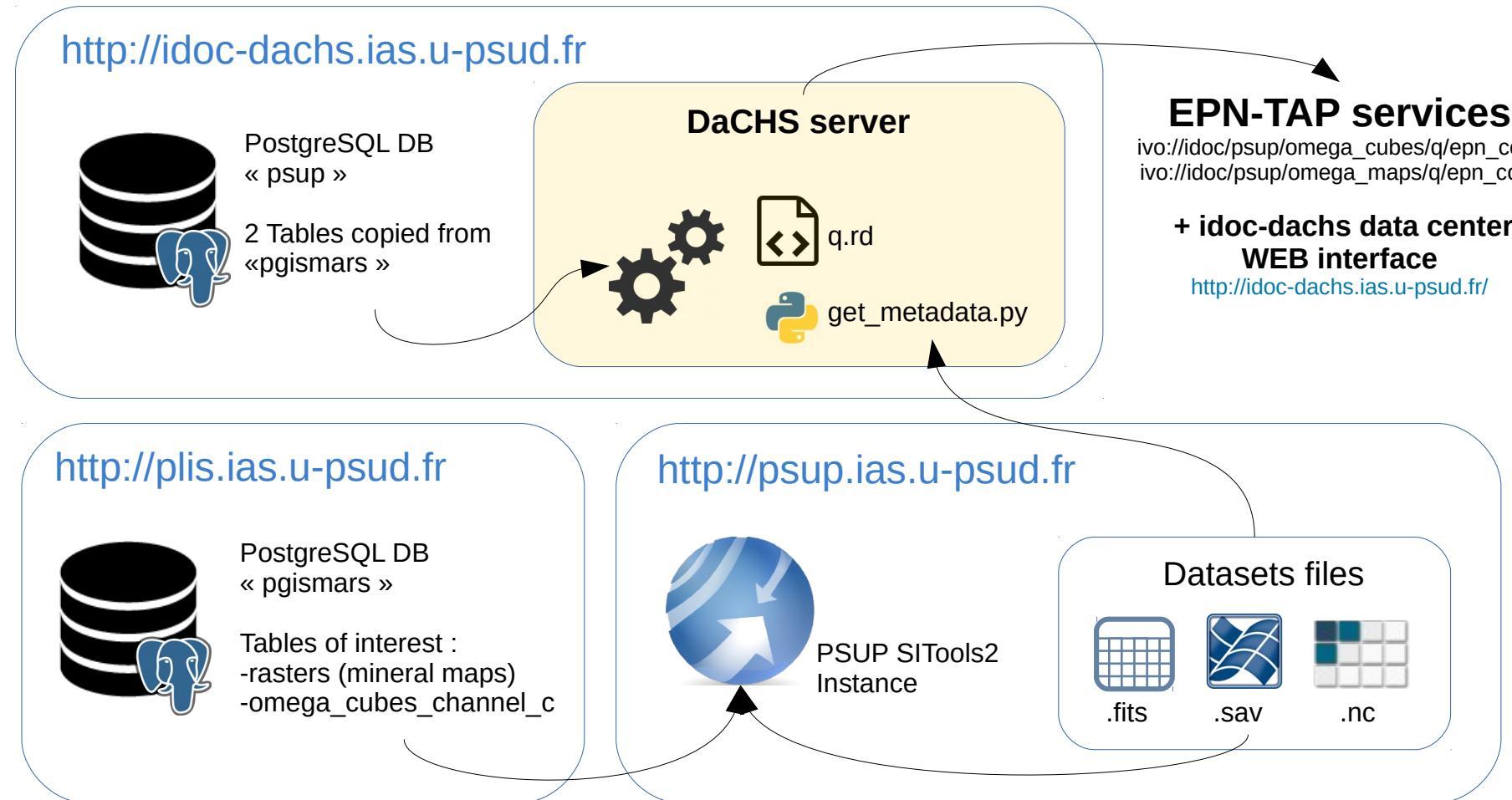


The screenshot shows the PSUP client user interface. At the top, the URL is psup.ias.u-psud.fr/sitools/client-user/index.html?project=PLISonMars. The header features the "Planetary SURface Portal" logo with a background image of a planetary surface. Below the header, there are links for Home, Project Description, Documentation, MarsSi, and Mars Visu. A navigation bar at the bottom includes Home, Project Description, Documentation, MarsSi, and Mars Visu. On the left, a sidebar lists datasets: OMEGA mineral maps, Catalogs, OMEGA_C_channel_Proj, and OMEGA_data_cubes. The first three items are highlighted with a teal border and a bracket on the right side of the list, indicating they were selected for EPN-TAP services. The text "PSUP datasets selected to create EPN-TAP services with DaCHS server." is overlaid on the right side of the highlighted list.

	Desc	Data
OMEZA mineral maps	[Info]	[Data]
Catalogs	[Info]	[Data]
OMEZA_C_channel_Proj	[Info]	[Data]
OMEZA_data_cubes	[Info]	[Data]

PSUP datasets selected to create EPN-TAP services with DaCHS server.

IDOC VM for DaCHS server



How to query IDOC TAP services

IDOC DaCHS Service Interface

http://idoc-dachs.ias.u-psud.fr/__system__/dc_tables/list/form



idoc-dachs Public Tables

Result
Matched: 8

[Send via SAMP](#) [Quick Plot](#)

Tablename	Info	Table desc.	Res desc.
omega_cubes.epn_core	Table Info	Mars Express - Omega Cubes	*** PSUP Omega Cubes *** The database contains all the OMEG the C channel. Filtering processes have been implemented artefacts and observational conditions. OMEGA is the spectro-ir atmospheric and aerosol contributions. OMEGA is the spectro-ir Mars-Express mission, inserted on the martian orbit the Observatories of Paris Sud (OSUPS) and Lyon (OSUL) have imple (Planetary SUrface Portal), for providing users with efficient and dedicated to the Martian sur
omega_maps.epn_core	Table Info	Mars Express - Omega Mineral Maps	*** PSUP Omega Maps *** PSUP Omega Mineral maps are OME BD530, Olivine SP1, SP2, SP3, Pyroxene and water BD maps. O instrument of the ESA Mars-Express mission, inserted on the maria 2003. The Observatories of Paris Sud (OSUPS) and Lyon (OSUL) called PSUP (Planetary SUrface Portal), for providing users with data products dedicated to the Martian sur

[Try ADQL](#) to query our

IDOC DaCHS Service Interface

http://idoc-dachs.ias.u-psud.fr/__system__/dc_tables/show/tableinfo/omega_cubes.epn_core



Table information for 'omega_cubes.epn_core'

General

Table Description: Mars Express - Omega Cubes

This table is available for [ADQL queries](#) and through the [TAP endpoint](#).

Resource Description: *** PSUP Omega Cubes *** The database contains all the OMEGA observations acquired with the C channel. Filtering processes have been implemented to remove some instrumental artefacts and observational conditions. OMEGA C channel data cubes are corrected for atmospheric and aerosol contributions. OMEGA is the spectro-imaging instrument of the ESA Mars-Express mission, inserted on the martian orbit the 25th of December 2003. The Observatories of Paris Sud (OSUPS) and Lyon (OSUL) have implemented a portal, called PSUP (Planetary SURface Portal), for providing users with efficient and easy access to data products dedicated to the Martian surface. *** Scientific interest ***

For a list of **all services and tables** belonging to this table's resource, see [Information on resource 'L3 Omega Cubes - Mars Express'](#)

Further Information at: <http://psup.ias.u-psud.fr>

Help	
Service info	
Metadata	
Identifier	ivo://idoc/psup/omega_cub
Cite this	
Advice on citing this resource	
Description	Mars Express - Omega Cu
Keywords	Mars
Creator	IDOC

IDOC DaCHS Service Interface

http://idoc-dachs.ias.u-psud.fr/__system__/adql/query/form?__nevow_form



ADQL Query

Parameters

- ADQL query: select * from omega_cubes.epn_core

Result

Matched: 100

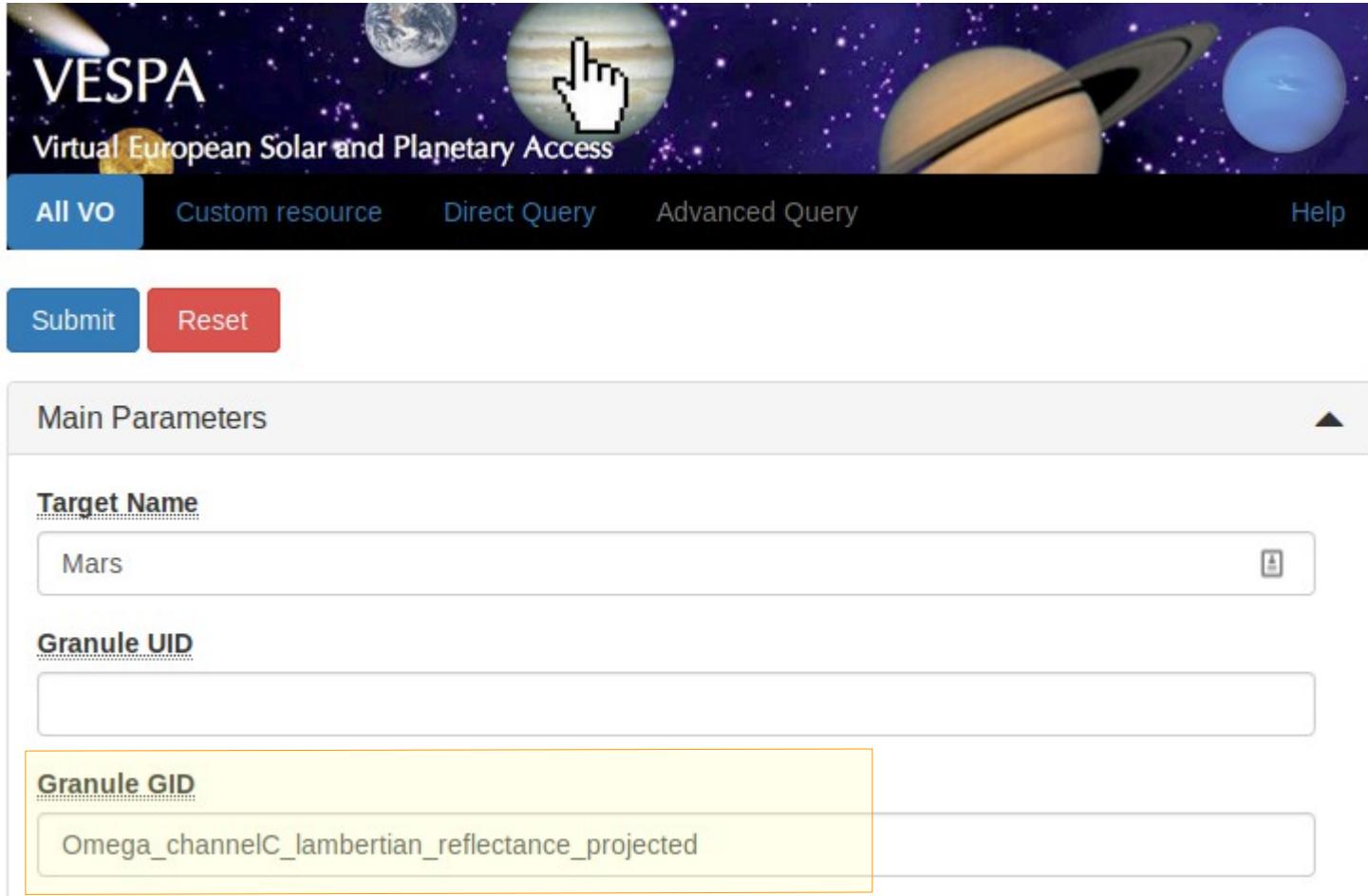
[Send via SAMP](#) [Quick Plot](#)

Query result probably incomplete due to the match limit kicking in. Queries not providing a TOP clause will be furnished with an automatic TOP 2000 by the machinery, so adding a TOP clause with a higher number may help.

Granule_uid	Granule_gid	Obs_id	Dataproduct_type	et_prod	Target_name	Targe
47_1_sav	Omega_channelC_lambertian_reflectance_projected	47_1		sc	Mars	
47_1_nc	Omega_channelC_lambertian_reflectance_projected	47_1		sc	Mars	

VESPA Query Interface

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



The screenshot shows the VESPA Query Interface. At the top, there is a banner with the text "VESPA" and "Virtual European Solar and Planetary Access". Below the banner, there is a navigation bar with buttons for "All VO", "Custom resource", "Direct Query", "Advanced Query", and "Help". Below the navigation bar, there are two buttons: "Submit" (blue) and "Reset" (red). The main area is titled "Main Parameters". It contains three input fields: "Target Name" with the value "Mars", "Granule UID" (empty), and "Granule GID" with the value "Omega_channelC_lambertian_reflectance_projected". The "Granule GID" field is highlighted with an orange border.

VESPA Query Interface



VESPA
Virtual European Solar and Planetary Access

All VO Custom resource Direct Query Advanced Query Help

EPN Resources

[omega_cubes - L3 Omega Cubes from PSUP](#) 7038 results

Omega spectral cubes from PSUP. The database contains OMEGA observations acquired with the C (short wavelength NIR) channel. Filtering processes have been implemented to remove some instrumental artefacts and observational conditions. OMEGA C channel data cubes are corrected for atmospheric and aerosol contributions. Data are available as netcdf and idl sav files.

Credits:

Creators: Karin Dassas

Contributors: IDOC

Publisher: Institut d'Astrophysique Spatiale - IDOC



[abs cs - Data for numerical modeling of planetary atmospheres](#) 0 result



VESPA Query Interface

VESPA
Virtual European Solar and Planetary Access

All VO Custom resource Direct Query Advanced Query Help

Results in service [omega_cubes](#)

Show entries

[Column visibility](#) [Show all](#) [Hide all](#)

[Select All in current page](#) [Reset Selection](#)

granule_uid	dataproduct_type	target_name	time_min (d)	time_max (d)	access_url
998_5_sav	spectral_cube	Mars	2004-10-29T04:37:09.039	2004-10-29T04:44:48.077	http://psup.ias.u-ps...
998_5_nc	spectral_cube	Mars	2004-10-29T04:37:09.039	2004-10-29T04:44:48.077	http://psup.ias.u-ps...
998_4_sav	spectral_cube	Mars	2004-10-29T04:31:09.041	2004-10-29T04:36:49.085	http://psup.ias.u-ps...
998_4_nc	spectral_cube	Mars	2004-10-29T04:31:09.041	2004-10-29T04:36:49.085	http://psup.ias.u-ps...
997_5_sav	spectral_cube	Mars	2004-10-28T21:54:03.039	2004-10-28T22:01:42.076	http://psup.ias.u-ps...
997_5_nc	spectral_cube	Mars	2004-10-28T21:54:03.039	2004-10-28T22:01:42.076	http://psup.ias.u-ps...

Plotting tools



TOPCAT



Aladin



SPLAT



CASSIS



3DView

Example queries

[Saturn in March 2012](#)

Aladin



[Download Aladin Desktop application](#)

Aladin v10.0

Fichier Edition Image Catalogue Graphique Couverture Outil Vue Interop Aide

Données disponibles → 2 Commande Référentiel ICRS Projection Aitoff

DSS SDSS 2MASS WISE GALEX PLANCK AKARI XMM Fermi Gaia Simbad NED +

ALADIN

ALADIN Sky Atlas - v10.0

ALADIN est un atlas du ciel interactif.
Il permet de visualiser des images digitalisées de n'importe quelle partie du ciel, d'y superposer des objets issus de catalogues astronomiques, et, interactivement, d'accéder aux informations relatives.

select. dans -- toutes les co... filtre

dév. tri vue scan grille exam. ligne nord multivues unif.

last news

New HiPS available:
• VISTA VIKING - 5 ...

select corr. dist. phot dessin coupe épo... taille dens. opac. zoom

depl. x-y rvb assoc marq cont pixel spect prop filtre suppr

0 sel / 0 src / 0 Mo

(c) 2018 Université de Strasbourg/CNRS - developed by CDS, distributed under GPLv3

Aladin

Données disponibles → 14 / 22128

- Collections → 14 / 22125
 - Others → 14 / 1228
 - SIA (image) → 2 / 284
 - CS (table) → 9 / 555
 - TAP (table) → 3 / 222
 - idoc → 3
 - idoc-dachs TAP service
 - * L3 Omega Cubes - Mars Express
 - * Omega mineral maps - Mars Express

sélect. **idoc** dans toutes les collections --

***New release**
no preview
Tabular

Omega mineral maps - Mars Express ...
Couverture inconnue (aucun MOC disponible)

Mode d'accès ✓ par critères

idoc/psup/omega_maps/q/epn_core Charger

TAP access with **idoc/psup/omega_maps/q/epn_core**

• **idoc/psup/omega_maps/q/epn_core** Mode

Générez, vérifiez et exécutez votre requête.

Table: **omega_maps.epn_** Set ra, dec

Select: ✓ All Constraints: Add new Max rows:

granule_uid

Refresh query Check.. SYNC Async jobs>>

```
SELECT TOP 10 * FROM omega_maps.epn_core
```

Clear Submit Fermer

Aladin

Commande **00:00:00.00 -90:00:00.0**

Référentiel **ICRS**

Projection **Aitoff**

ALADIN

http://psup.ias.u-psud.fr/sitools/datastorage/user/storage/marsdata/omega/fits/albedo_r10

Montrer
Réticule sur la position initiale du plan
Parcourir les objets du plan
Sélectionner tous les objets des plans
Désélectionner les objets
Crée un graphe de points
Crée un nouveau plan avec les objets

193.6° x 180°

grille exam. cligne nord hdr multivues unif. [Plane @1] - CDS/P/DSS2/color Chercher

access url	granule uid	granule gid	obs id	dataproduct t...	target na...
http://psup.ias	olivine osp1 eq.	Omega mineral...	olivine	map	Mars
http://psup.ias	olivine osp2 eq.	Omega mineral...	olivine	map	Mars
http://psup.ias	olivine osp3 eq.	Omega mineral...	olivine	map	Mars
http://psup.ias	albedo filled	Omega mineral...	albedo	map	Mars
http://psup.ias	pyroxene bd200	Omega mineral...	pyroxene	map	Mars
http://psup.ias	albedo unfilled	Omega mineral...	albedo	map	Mars
http://psup.ias	emissivite 5.03m	Omega mineral...	emissivity	map	Mars

coupe

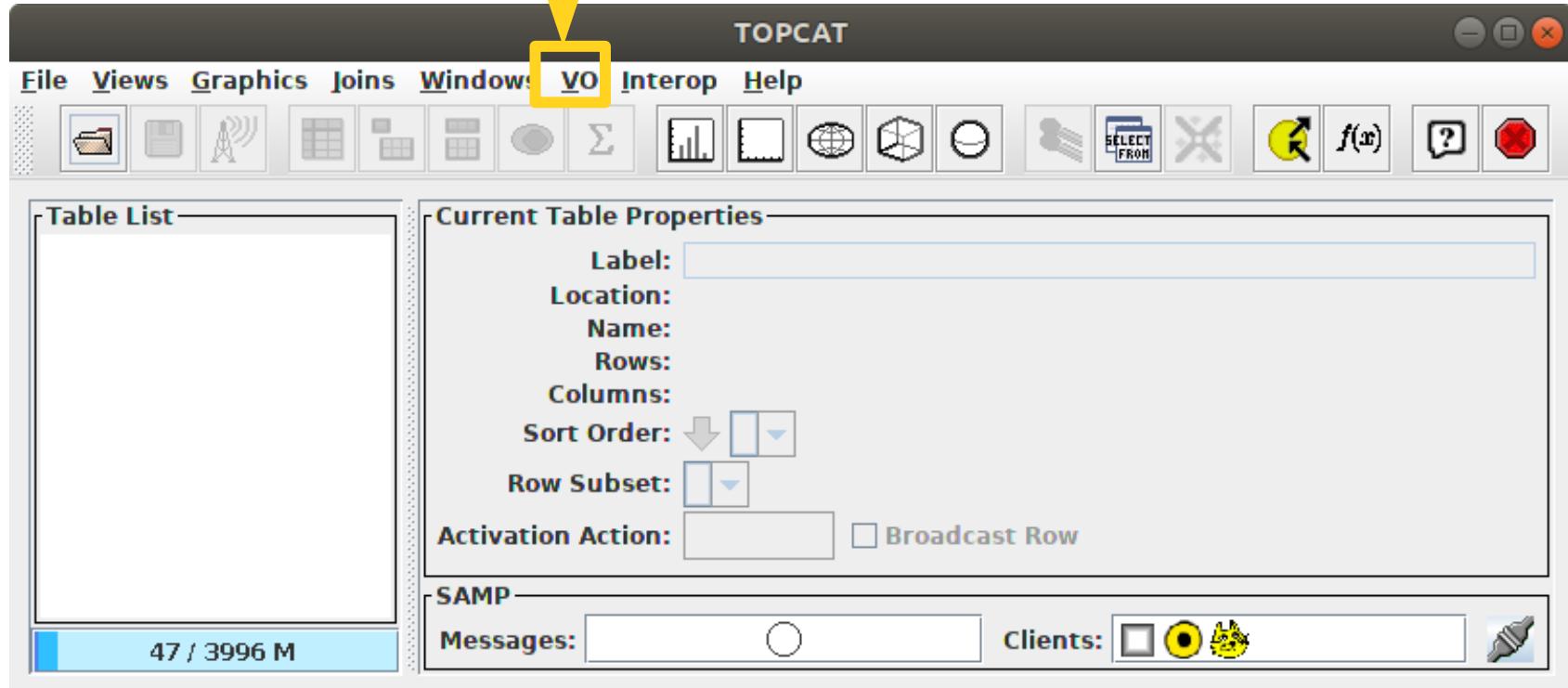
époq... -
taille -
dens. -
opac. -
zoom -

9 sel / 20 src 71fps / 96

TOPCAT



Download TOPCAT Desktop application



The screenshot shows the TOPCAT application window. The menu bar includes File, Views, Graphics, Joins, Windows, VO, Interop, and Help. The toolbar contains various icons for file operations, data selection, and visualization. The main interface is divided into several panels: 'Table List' on the left, 'Current Table Properties' in the center, 'SAMP' at the bottom, and status bars at the bottom showing '47 / 3996 M' and network activity.

Table List

Current Table Properties

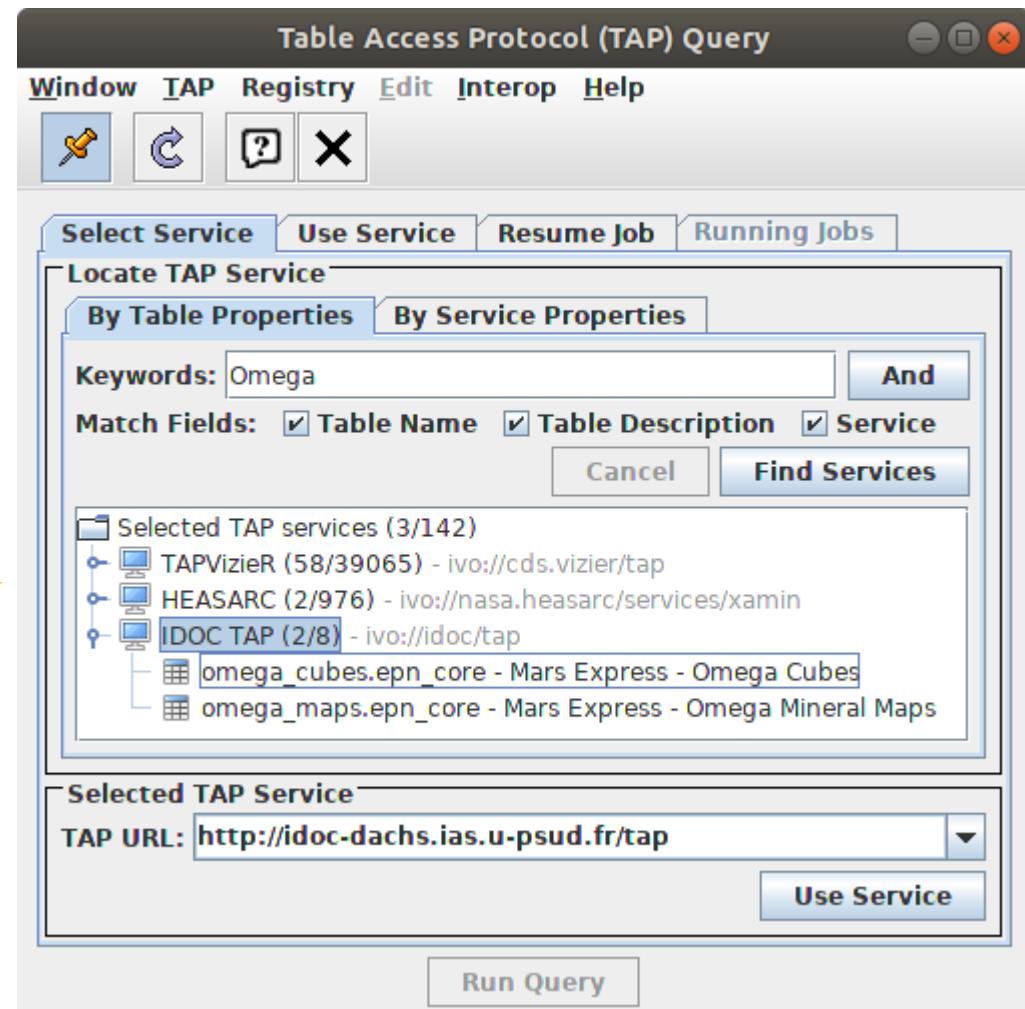
- Label:
- Location:
- Name:
- Rows:
- Columns:
- Sort Order: 
- Row Subset: 
- Activation Action: Broadcast Row

SAMP

Messages: 

Clients:  

TOPCAT



TOPCAT

Select Service Use Service Resume Job Running Jobs

Metadata

Find:

Name Descrip Or

Name	DataType	Indexed	Unit	Description
granule_uid	char	<input checked="" type="checkbox"/>		Internal table row index
granule_gid	char	<input type="checkbox"/>		Common to granules of
obs_id	char	<input type="checkbox"/>		Associates granules deri
dataproduct_type	char	<input type="checkbox"/>		The high-level organizat
target_name	char	<input type="checkbox"/>		Standard IAU name of t
target_class	char	<input type="checkbox"/>		Type of target, from en
time_min	double	<input type="checkbox"/>	d	Acquisition start time (in
time_max	double	<input type="checkbox"/>	d	Acquisition stop time (in

IDOC TAP (8)

- omega_cubes (1)
 - omega_cubes.epn_core
- omega_maps (1)
 - omega_maps.epn_core
- tap_schema (6)
 - tap_schema.columns
 - tap_schema.groups

Service Capabilities

Query Language: ADQL-2.0 Max Rows: 20000 (default) Uploads: 20Mb

ADQL Text

Mode: Synchronous

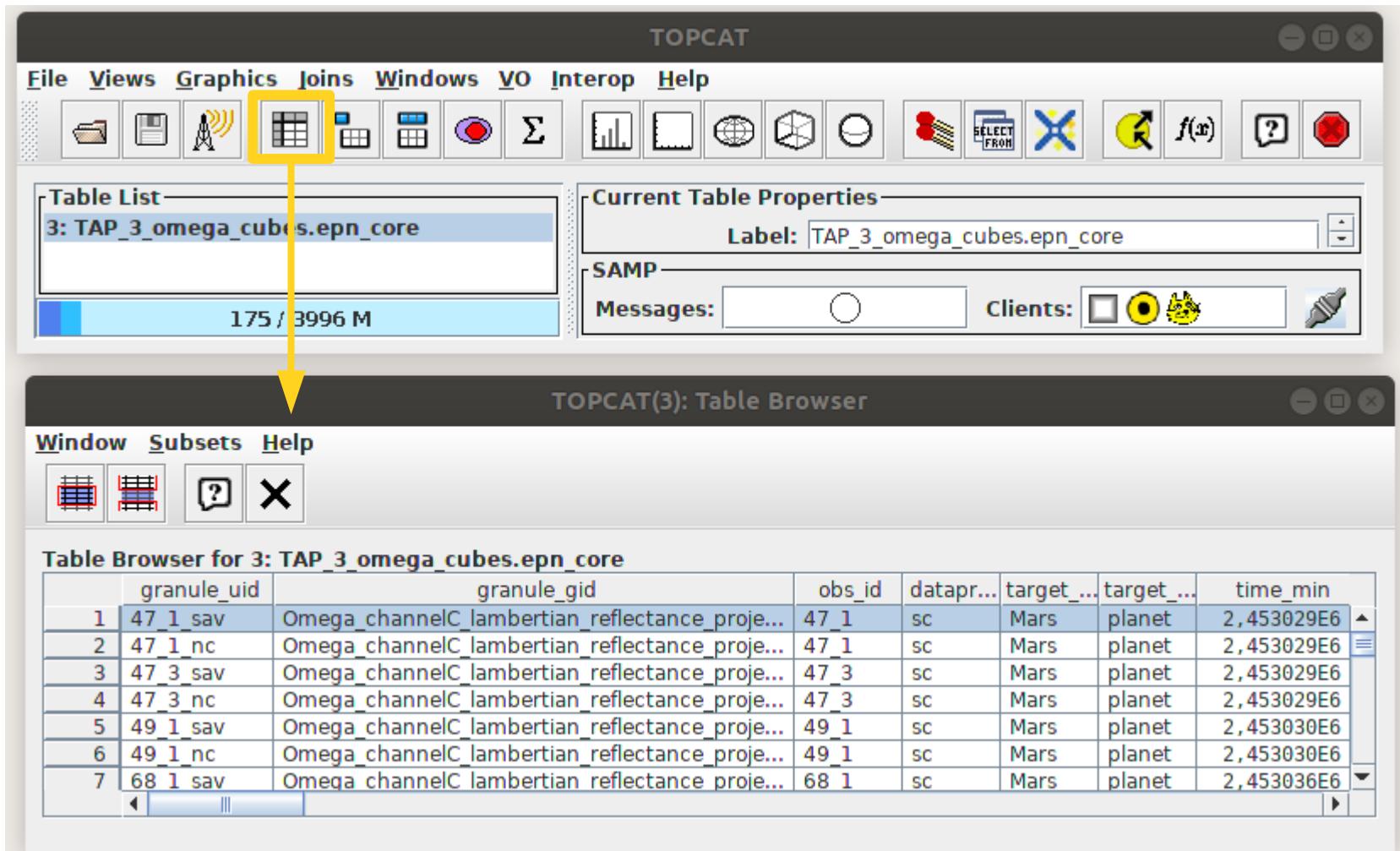


```
select * from omega_cubes.epn_core
```

Examples   

Run Query

TOPCAT



The screenshot shows the TOPCAT software interface. At the top, there is a menu bar with options: File, Views, Graphics, Joins, Windows, VO, Interop, and Help. Below the menu bar is a toolbar with various icons, one of which is highlighted with a yellow box and a yellow arrow pointing down to the Table Browser window.

The main window has two main sections:

- Table List:** Shows a list of tables. The first table listed is "3: TAP_3_omega_cubes.epn_core". Below it, it says "175 / 3996 M".
- Current Table Properties:** Displays properties for the selected table. The "Label" field is set to "TAP_3_omega_cubes.epn_core". There are also sections for "SAMP" and "Messages" and "Clients".

A large yellow arrow points from the highlighted toolbar icon down to the "Table Browser" window below.

The "Table Browser" window has its own menu bar with Window, Subsets, and Help, and a toolbar with four icons. It displays a table titled "Table Browser for 3: TAP_3_omega_cubes.epn_core". The table has columns for granule_uid, granule_gid, obs_id, datapr..., target_..., target_..., and time_min. The data rows are as follows:

	granule_uid	granule_gid	obs_id	datapr...	target_...	target_...	time_min
1	47_1_sav	Omega_channelC_lambertian_reflectance_proje...	47_1	sc	Mars	planet	2,453029E6
2	47_1_nc	Omega_channelC_lambertian_reflectance_proje...	47_1	sc	Mars	planet	2,453029E6
3	47_3_sav	Omega_channelC_lambertian_reflectance_proje...	47_3	sc	Mars	planet	2,453029E6
4	47_3_nc	Omega_channelC_lambertian_reflectance_proje...	47_3	sc	Mars	planet	2,453029E6
5	49_1_sav	Omega_channelC_lambertian_reflectance_proje...	49_1	sc	Mars	planet	2,453030E6
6	49_1_nc	Omega_channelC_lambertian_reflectance_proje...	49_1	sc	Mars	planet	2,453030E6
7	68_1_sav	Omega_channelC_lambertian_reflectance_proje...	68_1	sc	Mars	planet	2,453036E6