



# eur PLANET 2024

Research Infrastructure

H2020-INFRAIA-2019-1

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## Deliverable D7.4

<b>Deliverable Title:</b>	Report on extended Planetary Science support in CASSIS beta
<b>Due date of deliverable:</b>	31/05/2022
<b>Nature<sup>1</sup>:</b>	R
<b>Dissemination level<sup>2</sup>:</b>	P
<b>Work package:</b>	WP7
<b>Lead beneficiary:</b>	OBSPARIS
<b>Contributing beneficiaries:</b>	CNRS / IRAP
<b>Document status:</b>	Final

<b>Start date of project:</b>	01 February 2020
<b>Project Duration:</b>	48 months
<b>Co-ordinator:</b>	Prof Nigel Mason, University of Kent

1. **Nature:** R = Report, P = Prototype, D = Demonstrator, O = Other

2. **Dissemination level:**

PU	PP	RE	CO
Public	Restricted to other programme participants (including the Commission Service)	Restricted to a group specified by the consortium (including the Commission Services)	Confidential, only for members of the consortium (excluding the Commission Services)

## Executive Summary / Abstract:

This deliverable concerns the adaptation of the VO CASSIS Desktop tool for planetary science data.

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### 1. Introduction & Overview of Progress

CASSIS is a tool with multiple functionalities which makes it compatible with a set of protocols, interoperable models defined by the international consortium IVOA (International Virtual Observatory Alliance).

CASSIS already includes a module that allows you to query registered EPN-TAP services independently from the VESPA portal (function added during Europlanet 2020 RI).

CASSIS also makes it possible to identify and visualize atomic and molecular lines, again using protocols and models from the IVOA, but also from VAMDC (Virtual And Molecular Database Center)

#### a) Objective

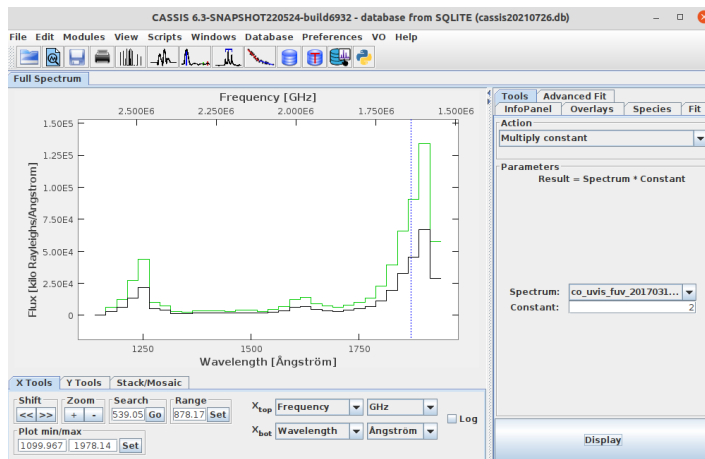
The objective is to adapt the CASSIS tool to manage Planetology spectra and spectral cubes. This deliverable describes the functionalities that will be implemented in the next CASSIS version (v6.3). A prototype (v6.3beta) will be released in July 2022 on the CASSIS IRAP website <http://cassis.irap.omp.eu>, after initial validation.

#### b) Explanation of the work carried in WP

#### Visualization, processing and analysis

For the visualization, processing and analysis of astrophysical spectra, we propose

- to improve the display of data intensity units in planetary science, so as to support measurements in reflected light with the most common normalization scales
- to add tools to process spectra, such as normalization by a solar spectrum
- to add the visualization of the data intensity errors

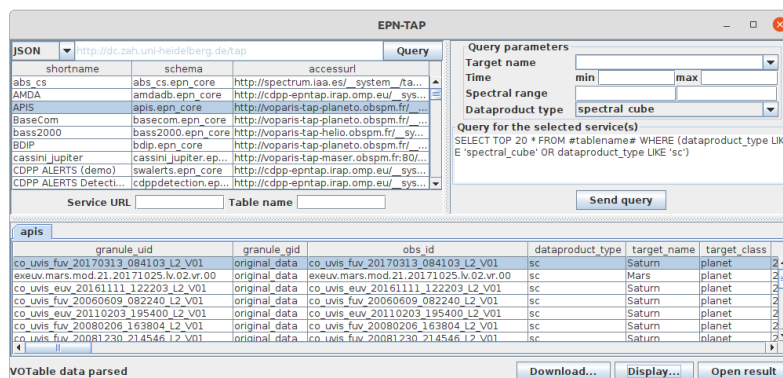


CASSIS Visualization

## CASSIS EPN-TAP module

For the CASSIS EPN-TAP module, we propose

- to update the data product type list from the EPN-TAP 2.0 model
- to add the possibility to select the service from the IVOA registry or from the local registry associated to the VESPA portal



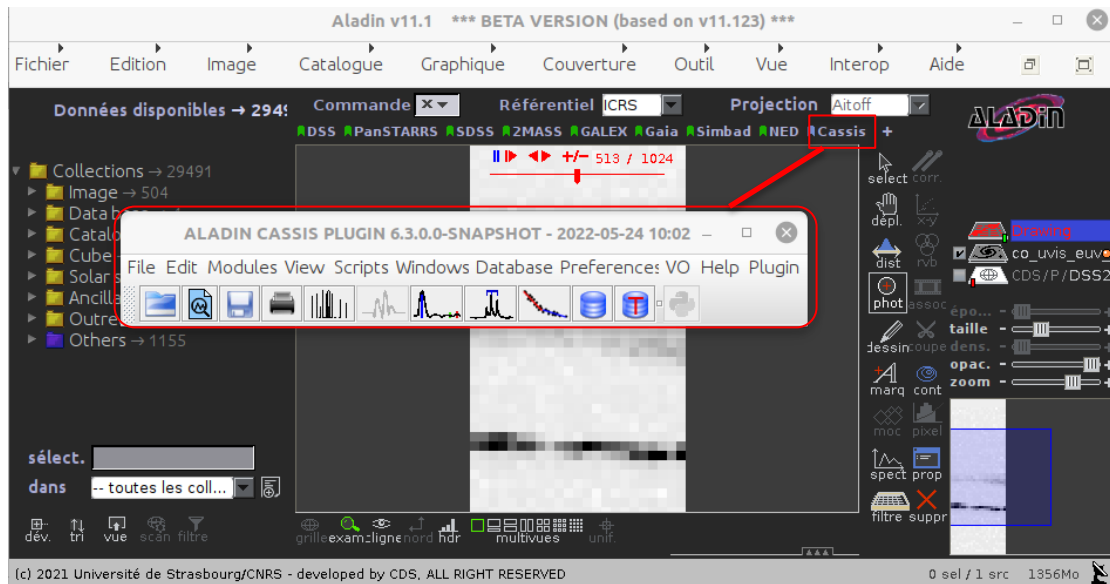
CASSIS EPN-TAP client

## Hyper spectral data

For hyper spectral data in planetology, we propose

- to add the possibility to extract spectra from fits cubes with the CASSIS Aladin plugin, either using Aladin tools to select the region of interest or directly with CASSIS asking the user to select specific spectra
- In the Aladin CASSIS plugin, to add functionalities to deal with multiple data cubes and to select the way to extract a spectrum when several pixels of the cube are selected (region of interest): either the average or median spectrum.

This functionality requires a VO-compliant input format for the cubes, such as fits or VOTables — while most archive data are available in PDS3. The fits spectral cube model studied during Europlanet 2020 RI is a convenient format for this purpose and may be generalized.



*CASSIS Aladin plugin run in Aladin*

### Identification and the visualization atomic and molecular lines

For the identification and the visualization of atomic and molecular lines, we propose to implement the band list system developed in SSHADE, and to interface CASSIS with the SSHADE database and similar sources of data supporting this system.