EPSC Abstracts
Vol. 13, EPSC-DPS2019-1272-1, 2019
EPSC-DPS Joint Meeting 2019

EPSC
EPSC-DPS Joint Meeting 2019
15–20 September 2019 | Geneva, Switzerland

MATISSE 2.0: a hub for the planetary sciences community

Angelo Zinzi (1), Marco Giardino (1), Giuseppe Sindoni (2), Eleonora Ammannito (2), Ettore Perozzi (2), Christina Plainaki (2), Maria Teresa Capria (3) and Ernesto Palomba (3), Gabriele Cremonese (4), Davide Grassi (3), Edoardo Rognini (3)
(1) Space Science Data Center – ASI (2) ASI (3) INAF-IAPS (4) INAF-OAPD (angelo.zinzi@ssdc.asi.it)

Abstract

After 6 years from its first release, MATISSE [1] is currently going through a substantial update phase focused on the improvement of both the tool interface and offered services. In particular, maintaining the 3D capabilities of the 1.x version, MATISSE 2.0 will be made available both from the web-interface and from command-line, thus helping the user to perform advanced and iterated operations. The interactive capabilities of MATISSE for the 2D option will be improved using the Planetary FITS standard [2].

1. Introduction

MATISSE (Multi-purpose Advanced Tool for the Instruments for the Solar System Exploration – https://tools.ssdc.asi.it/matisse.jsp) is the SSDC webtool to access, visualize and analyze data from planetary exploration missions. Its currently stable version is the 1.5, allowing the inspection of different datasets from 8 targets and instruments with different characteristics (e.g., camera, spectrometers and subsurface radars).

Apart from its use by the professional scientific community, MATISSE has also proven to be usable by non-trained people, such as high-school students involved in educational programs [3]. Therefore, since the current version of the tool is derived from the MATISSE initial version released in 2013, its upgrade, aimed at improving both its scientific values and its ease of usage, would be of valuable impact and is currently undergoing

The main goal of MATISSE 2.0 is to make easier the fusion between different datasets, providing at the same time a scientific add-on value, independently from the data-access mode (i.e. SSDC-local or remote access, compatible with international standards). The tool is also being developed so as to provide access to modelled datasets that can be further used for comparative planetology purposes.

2. Perspectives

Interaction between ASI personnel and associates, and researchers from the Italian national Astrophysics Institute (INAF) with expertise in different research disciplines related to planetary sciences (e.g. small bodies, terrestrial planets, gaseous and ice giants, planetary space weather, etc.) and advanced ICT technologies, should guarantee major advances and an extremely solid scientific base.

A series of new collaborations with national and international scientific research groups involved in different missions and activities (i.e., ExoMars, Juno, BepiColombo, VESPA, Open Planetary, NEO hazard and planetary defense), is expected to provide substantial feedback for making the tool more versatile, allowing a further opening to a wider interdisciplinary community.

Among these, examples of fruitful collaborations, currently under development, are the following:

- integration of the retrieval code for atmospheric species by [4, 5] for Juno-JIRAM
- ingestion of the ExoMars CaSSIS [6] images and DTMs in order to provide panchromatic high-resolution 3D visualizations
- addition of a thermal conductivity model for airless bodies, directly usable for comparisons with BepiColombo data from Mercury [7]

3. Conclusions and future works

The web platform for MATISSE 2.0 can now interact with the GIS-like database used and support the 3D and 2D visualizations directly on the web browser for some selected missions with public data (such as VIR-Dawn at Vesta – Fig. 1).

In the short period we plan to release a beta version in order to get feedbacks from the community and, in the very next future, we will add the peculiar features outlined in previous sections, together with new datasets.

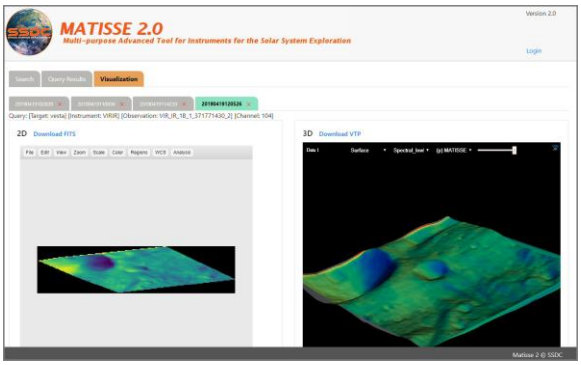

Figure 1: The output page of MATISSE 2.0, with a Dawn-VIR observation of Vesta.

References

[1] Zinzi et al., 2016, Astronomy & Computing

[2] Marmo et al., 2018, Earth and Space Science

[3] https://www.ssdc.asi.it/news.php?view=all#382

[4] Grassi et al., 2017, 10.1016/j.jqsrt.2017.08.008

[5] Grassi et al., 2010, 10.1016/j.pss.2010.05.003

[6] Thomas et al., 2017, Space Scie.Rev., 212, 1897

[7] Rognini et al., EPSC-DPS 2019