SPIDER

Sun Planet Interactions
Digital Environment
on Request

WP5

SPIDER
Sun Planet Interactions Digital Environment on Request

Beneficiaries

Centre National de la Recherche Scientifique (CNRS) – France *(21.7 PMs)*

Istituto Nazionale di Astrofisica (INAF) - Italy *(24 PMs)*

Institutet För Rymdfysik (IRF) – *Sweden (6 PMs)*

Office National d'Etudes et de Recherches Aérospatiales - France (5.5 PMs)

Observatoire Paris Meudon (OBSPARIS) – France (1.5 PMs)

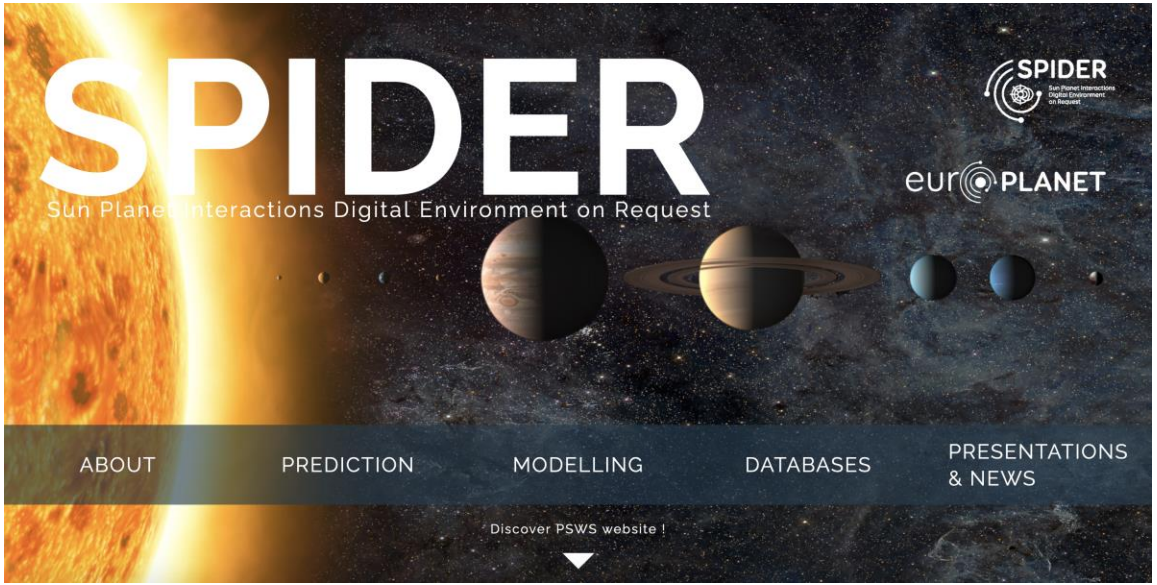
University College London – UK (2.73 PMs)

Wigner Institute (Wigner) – Hungary *(3 PMs)*

SPIDER

Sun Planet Interactions
Digital Environment
on Request

http://spider-europlanet.irap.omp.eu/



SPIDER

Sun Planet Interactions
Digital Environment
on Request

Key missions in the period:

- Solar Orbiter / Solar Parker Probe (in operations)
- BepiColombo (1st Mercury flyby in 2021)
- JUICE (to be launched in 2022)

bepicolombo

Services to be focused on:

- Heliosphere
- Mercury
- Jupiter and Galilean moons

juice

SPIDER
Sun Planet Interactions Digital Environment on Request

C. Model - INAF, ONERA, UCL

C5. A service for runs on request of models of Jupiter's moon exospheres as well as the exosphere of Mercury.

C6. A service to connect the open-source Spacecraft-Plasma Interaction Software (SPIS) software with models of space environments in order to compute the effect of spacecraft potential on scientific instruments onboard space missions. Pre-configured simulations will be made for Bepi-Colombo and JUICE missions.

C7. A service for runs on request of particle tracing models in planetary magnetospheres.

SPIDER
Sun Planet Interactions Digital Environment on Request

E. Databases - IRF and CNRS

E1. A database of the high-energy particle flux proxy at Mars, Venus and comet 67P using background counts observed in the data obtained by the plasma instruments onboard Mars Express (operational from 2003), Venus Express (2006–2014), and Rosetta (2014–2015).

E2. A simulation database for Mercury and Jupiter's moons magnetospheres and link them with prediction of the solar wind parameters from Europlanet-RI H2020 PSWS services.

SPIDER
Sun Planet Interactions
Digital Environment
on Request

A. Predict - CNRS

A1. An extension of the Europlanet-RI H2020 PSWS Heliopropa service in order to ingest new observations from Solar missions like the ESA Solar Orbiter or NASA Solar Parker Probe missions and use them as input parameters for solar wind prediction.

SPIDER
Sun Planet Interactions Digital Environment on Request

1st year achievements

- SPIDER Website
- EPSC 2020 sessions on planetary space weather organized
- 1st BepiColombo, Solar Orbiter data ingested in CNRS tools
- Publicly available Parker Solar Probe data ingested in CNRS tools
- Extension of the Europlanet RI H2020 Heliopropa service for Bepi, Solo, PSP
- 1st background plasma data from MEX and VEX delivered by IRF and ingested in CNRS tools
- Run on request service from INAF for Mercury' and Europa's exopheric modelling available(http://150.146.134.250/cgi-bin/modello-input.pl)

SPIDER
Sun Planet Interactions Digital Environment on Request

2nd year achievements

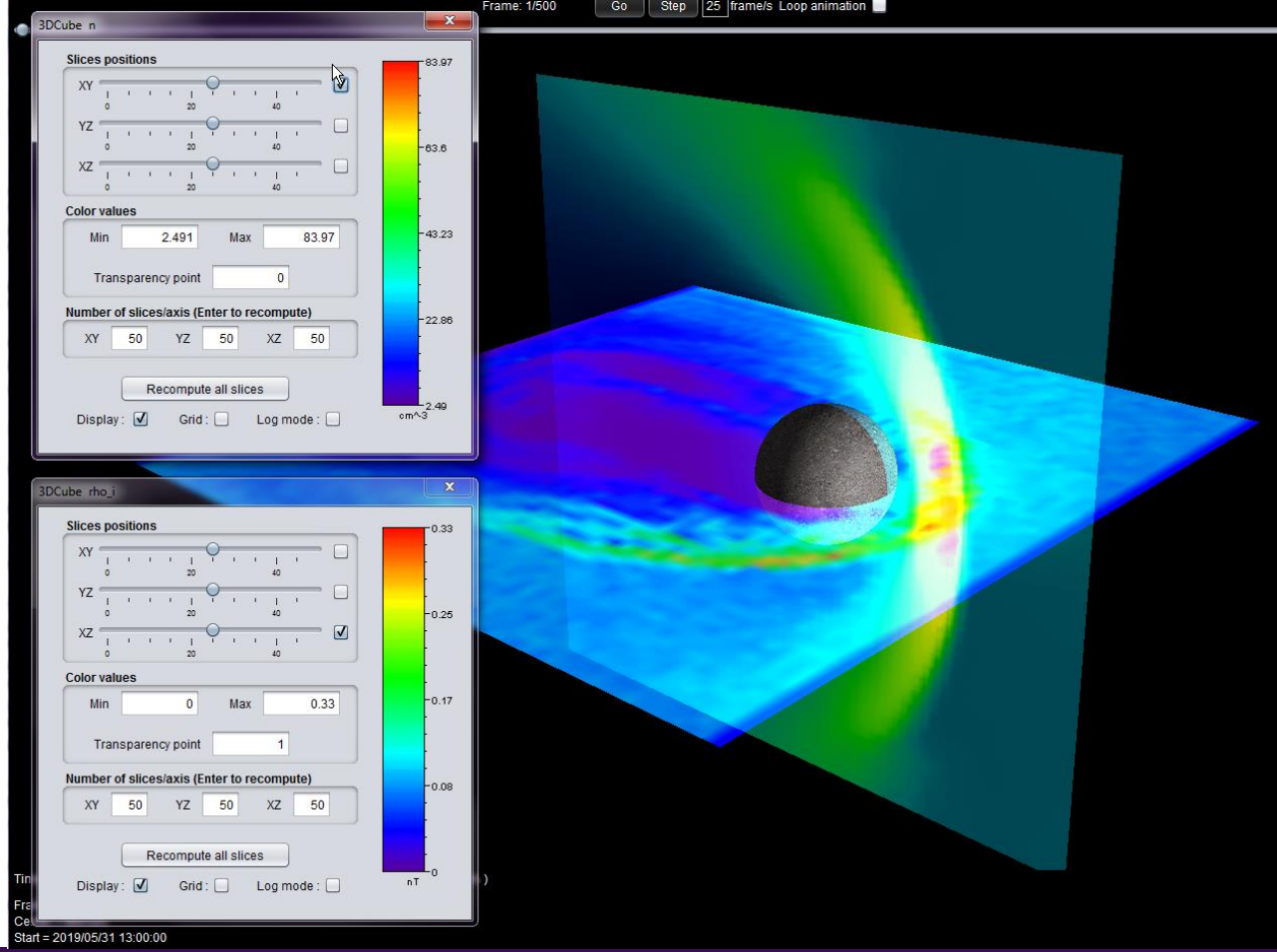
- EPSC 2021 sessions on planetary space weather proposed and merged
- 1st publication by S. Aizawa et al., Cross-comparison of global simulation models applied to Mercury's dayside magnetosphere, Planetary and Space Science, Volume 198, article id. 105176 (2021)
- 2nd publication by Hadid et al., BepiColombo's cruise phase: unique opportunity for synergistic observations, Frontiers in Astronomy and Space Sciences, Volume 8, id.154 (2021)
- Use of the Europlanet RI H2020 Heliopropa service for Bepi, Solo, PSP
- Connection of the SPIS software with the CDPP/AMDA database at CNRS
- Preparation of the infrastructure at CNR to ingest the UCL service for particle tracing models, based on the Magnetodisc service developed during Europlanet H2020 PSWS

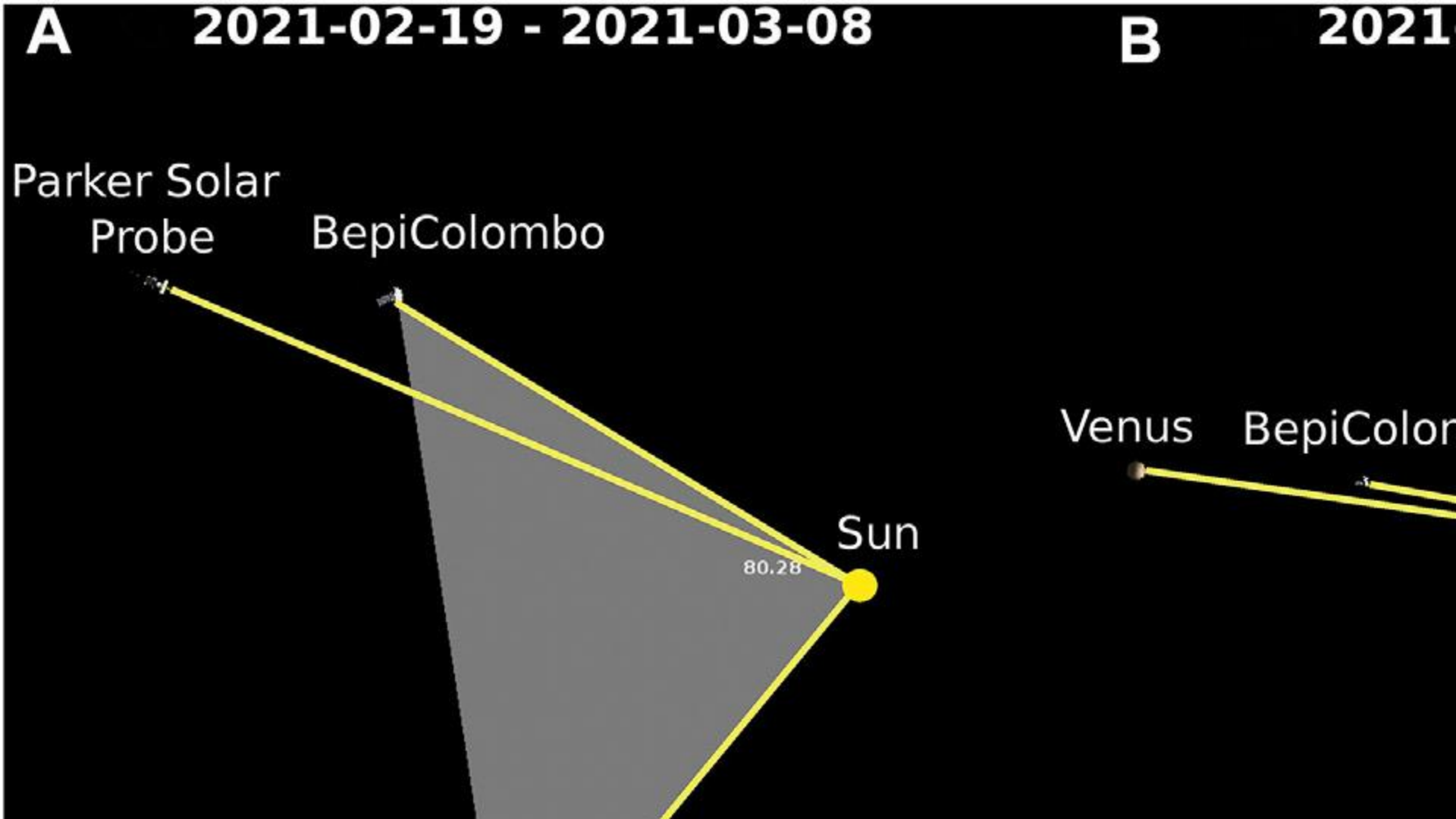
SPIDER

Sun Planet Interactions Digital Environment on Request

Numerical simulations

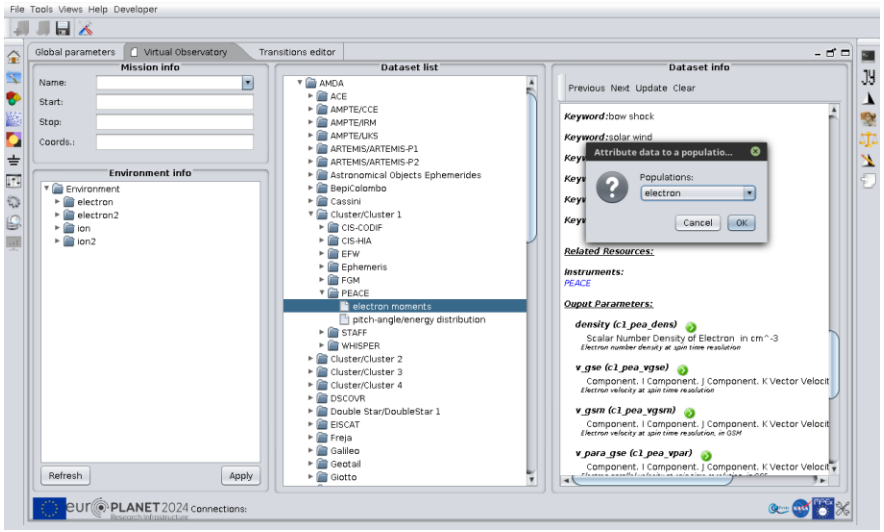
Aizawa et al., 2021

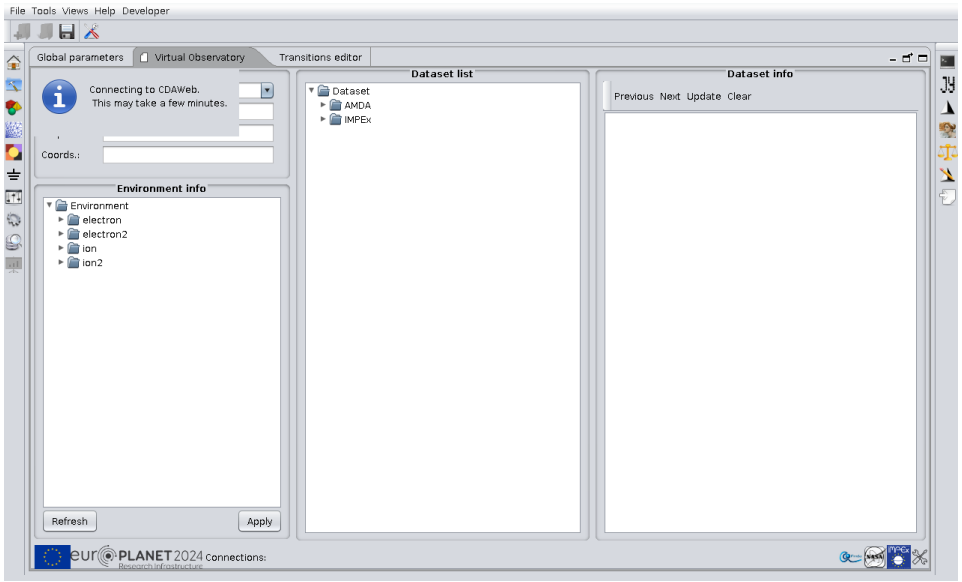



A
2021-02-19 - 2021-03-08
B
2021
Parker Solar Probe
BepiColombo
Sun
80.28
Venus
BepiColon

SPIDER

Sun Planet Interactions
Digital Environment
on Request





SPIS-AMDA Connection

SPIDER
Sun Planet Interactions Digital Environment on Request

Deliverables

- D5.1 Mercury exosphere run on request service (INAF) M10
- D5.2 Planetary plasma instrument background count database (IRF) M10
- D5.3 SPIDER 1st annual report (CNRS) M12
- **D5.4 SPIDER 2nd annual report (CNRS) M24**
- **D5.5 Planetary SPIS service (ONERA) M25**
- **D5.6 Galilean exosphere run on request service (INAF) M25**
- **D5.7 Planetary particle tracing service (UCL) M25**
- D5.8 SPIDER 3rd annual report (CNRS) M36
- D5.9 Advanced Heliopropa Service (CNRS) M37
- D5.10 Run on request architecture implementation (OBSPARIS) M40
- D5.11 SPIDER 4th annual report (CNRS) M48

SPIDER
Sun Planet Interactions
Digital Environment
on Request

Milestones

• MS2 SPIDER KO meeting	M2
• MS3 Set up VA review board	M3
• MS19 EPSC 2020 SPIDER session	M8
• MS45 EPSC 2021 SPIDER session	M20
• MS78 EPSC 2022 SPIDER session	M32
• MS105 EPSC 2023 SPIDER session	M44

SPIDER
Sun Planet Interactions
Digital Environment
on Request

Interfaces

- SPIDER/VESPA
  - New databases to be published in VESPA (both observational and numerical)
  - Use of EOSC to be studied
- SPIDER/ML
  - How to connect ML tools to SPIDER tools (like AMDA for example) ?
  - Dedicated plug-ins ?
- SPIDER/GMAP
  - Connection surfaces/external environment ?

SPIDER
Sun Planet Interactions Digital Environment on Request

No change in funding !

Centre National de la Recherche Scientifique (CNRS) – France	*117.5 keuros*
Istituto Nazionale di Astrofisica (INAF) - Italy	*125 keuros*
Institutet För Rymdfysik (IRF) – *Sweden*	*50 keuros*
Office National d'Etudes et de Recherches Aérospatiales - France	*50 keuros*
University College London	*28 keuros*
Observatoire Paris Meudon (OBSPARIS) – France	*20 keuros*
Wigner Institute (Wigner) – Hungary	*13.6 keuros*

404.1 keuros