CDPP/AMDA Tool
for Cassini & JUICE

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CDPP  

http://cdpp.cesr.fr/

- The french Space Plasma Datacenter
  (director: Vincent Génot)
- Funded by CNES and CNRS
- Hosted at IRAP, Toulouse
- Data archives
- Added Value Services
Rationale

• The growing amount and wealth of data available make it difficult for scientists to exploit data coming from many sources that can initially be heterogeneous in their organization, description and format.

• One of our objective is to provide easy-to-use access to planetary plasma resources from various data archives.

• One of our objective is to provide Virtual Observatory tools for the access of data, combining as divergent data sources as feasible.
AMDA Tool and Functionalities

Web-based service Publicly available

Produces / exploits time-tables, catalogues

Transparent (automated) access to data
the user plays with parameters, not with files
New Planetary Plasma Datasets in AMDA

MESSENGER: Orbit, MAG, FIPS, EPPS + Mariner

VEX: Ephem, MAG, ELS, IMA + PVO

MGS: Orbit, Ephem, MAG, ER, Proxy

MEX: Orbit, Ephem, IMA, ELS, MARSIS

Galileo: Orbit, Ephem, MAG, PLS, PWS, EPD

Pioneer 10 & 11: Orbit, MAG

Ulysses: Orbit, MAG, SWOOPS, URAP (QTN)

Voyager 1 & 2: Orbit, MAG, PLS, PWS (fuh), PRA (LB+HB), LECP

Cassini: Orbit, Ephem, MAG, SKR longitude system, CAPS + MAPSKP (RPWS, CAPS, MIMI, MAG)

plasma moments from RPWS: LP + QTN + Sounder

Voyager 1 & 2: Orbit, MAG

Remote access Available, Coming soon, Future
Service(s) provided to the giant planet community

• Exploitation of Cassini Magnetosphere and Plasma Science
    • Need for statistical analysis
    • Need for conditional search (case studies)
    • Need for multi-instrument studies
  – Need for pluridisciplinary studies
    • E.g., Satellite science

• Preparation of Juno
  – Need for pluridisciplinary studies
    • E.g., Auroral science (magnetosphere/ionosphere coupling)

• Preparation of JUICE
  – Need for re-analysis of previous datasets
    • Mission preparation
    • Instrument preparation (CEPAGE consortium led by IRAP)
Cassini/Huygens datasets available in AMDA
Illustration #1: 2 Enceladus flybys

With background subtraction!
Illustration #2: Titan TA flyby

CAPS ELS
CAPS SNG
MAG
TA flyby

CAPS ELS
CAPS SNG
MAG

LP

Oct 26 2004
Illustration #3: Magnetosphere (2 Rev.)
Illustration #4: Auroral campaign

AMDA/Aladin Connection
Clic to open plot window
1. drag & drop parameters

2. select time interval

3. click to plot
click to connect to SAMP hub
Send to Aladin via SAMP
Jupiter datasets available in AMDA
Illustration #1: Ganymede flybys

With background subtraction!
Illustration #2: Europa & Callisto flyby
Illustration #3: Magnetosphere
Illustration #4: Auroral campaign
Illustration #4: Auroral campaign
3DView/CDPP is a tool for scientists that offers immediate 3D visualization of position and orientation of spacecraft, planetary ephemerides, as well as scientific data representation.

Features:
- Heliocentric view
- Bodies lighting and maps
- Orbit and attitude
- Instrument bore sight
- Distances time evolution
- Bow shock and magnetopause
- Van Allen belts (L-Shells)
- South Atlantic Anomaly
- Stars
- Shadows
- Ground trace
- Ground stations
- ASCII file data export
- Image and movies generation

3DView/CDPP is a tool for scientists that offers immediate 3D visualization of position and orientation of spacecraft, planetary ephemerides, as well as scientific data representation.

3DView/CDPP is a versatile, lightweight and interactive software, intended to be intuitive and easy to use.

The following missions are included: CoRoT, Rosetta, PICARD, Jason2, MRO/MSL, Mars-Express, Venus-Express, Cassini, Planck, Galileo, Ulysses, Voyager1-2, Stereo, Cluster, ACE, Wind, Geotail, SOHO, Giotto, Themis, Intercali.

Available data are described here.

Supplementary missions will be added if needed.

3DView/CDPP runs as a JAVA applet; it is compatible with WINDOWS XP, VISTA, SEVEN, as well as MAC OSX and LINUX *

For a deep description of the 3DView/CDPP capabilities, go to tutorial.

* JAVA 6 required. See also java2D requirements

Welcome to 3DView/CDPP

Launch 3DView
Illustration #1: Earth
Visualization of Galileo EPD (energetic particle) data during 1 Europa flyby
Illustration #3: JUICE

JUICE trajectory/ephemeris has been implemented in CDPP/3DView plasma (JUNO also)
Perspectives

• Cassini MAPS datasets included in the CDPP/AMDA tool. Enhancing science return to the potential benefit of the broader science community.

• A Jupiter database including all publicly available magnetospheric and plasma data from previous missions to Jupiter has been built in the CDPP/AMDA (Automated Multi-Dataset Analysis) tool. This tool can be used to re-analyze past datasets (including Galileo) in order to prepare and optimize proposed JUICE instrumentation to the potential benefit of the JUICE teams and the broader science community.

• The 3DView/CDPP Tool can be used to visualize JUICE mission phases as well as prepare science mode operation plans, and will be regularly updated as the mission progresses to the potential benefit of the JUICE teams and the broader science community.

• AMDA/Aladin interoperable connection has been developed. This enables in-situ/remote auroral studies at giant planets. The service has been built around HST datasets and will be adapted to spacecraft imagers/spectrometers (e.g., UVIS). This will be adapted in preparation of Juno.
Links

- http://cdpp.cesr.fr/
- http://3dview.cesr.fr/
- http://europlanet-plasmanode.oeaw.ac.at/