

Planetary Data Archiving at ESA Report

**IPDA Steering Committee Meeting
July 11th - 12th 2008**

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Outline

- PSA Summary**
- Services updates: end-user**
 - User Interfaces
 - WWW site updates
 - The Map Based Interface
- Service updates: data producer**
- Current data set status**
- Upcoming data releases**
- PSA and PDS Collaborations**
- Standards conflicts**
- Other Issues and Lessons Learned**

PSA - Definition and Purpose

The Planetary Science Archive (PSA) is the initiative, the setup, the process and the implementation to preserve data from ESA's spacecraft to planetary bodies, as well as supplementary information acquired in laboratories or ground-based observatories.

The prime objectives of the PSA are:

- *to support the experimenter teams in the preparation for the spacecraft and ground-based long-term archives*
- *to enable and ensure the (long-term) preservation of these archives*
- *distribution of scientific useful data to the world wide scientific community*
- *provision of supplementary data services aiming to maximize the usage of planetary mission data and ease the scientific data analysis.*

The PSA will be advised by a PSA Scientific Advisory Group (name tbc) that meets at least yearly.

PSA Use Interface (Services)

<http://www.rssd.esa.int/psa>

- Data Query
 - One concept for all missions and instrument
 - Mission specific queries
 - Instrument specific queries
 - Geometrical and positional related queries
 - 'query save' for end user

- Data Retrieval
 - Direct data product retrieval
 - 'delivery basket' functionality for
 - Full data set retrieval
 - Multiple data product retrieval
 - Retrieve the results of multiple queries

- Browse data / thumbnails whenever applicable

End Users, Services and Functionalities Offered

- **PSA Scientific Advisory Group**
- **Helpdesk**
- **Data Query and Retrieval**
- **PDS Standard Support**
- **Coordination and chair for Peer Reviews**
- **Design, Production and Delivery of auxiliary data**
 - SPICE conversion
 - Software consultancy and support
 - ESOC data long-term archive preparation
 - Science planning information, long-term archive preparation

Data Producers, Services and Functionality Offered

- **Data Archive Workshops (on request) - three so far**
- **SPICE Workshops (on request) ~yearly**
- **Individual Archive Consultancy**
- **Coordination of Mission Data Archive Working Groups (DAWG)**
- **Coordination and support of Mission geometrical parameter information**
- **Dataset Support Tools**
 - Dataset validation
 - Dataset ingestion



PSA Data Producer Service

❑ We offer a PSA Volume Verification Tool (PVV)

- Data producer
 - Can verify the structure of the whole data set
 - Can verify the content of the ODL language
 - Can verify the references, catalogue structure, etc
- Database
 - Can easily ingest data sets (expected to be less a working day)

❑ PVV includes

- Semi-automatic update of the tool
- Direct connection to the PSA database (network based)
 - Always the latest dictionary
- Support of former dictionary versions

❑ PVV does not include

- A guarantee of PDS compliance!

❑ PVS: qualitative validation

Current Status, Available Datasets

- GIOTTO data from comet Halley and Gripp-Skellerup
- Comet Halley ground-based observations (Halley-Watch)
- Comet Wirtanen ground-based observations
- Mars Express instrument and auxiliary data - ongoing deliveries. MARSIS data release June 2008! PFS data release imminent.
- Huygens instrument and housekeeping data
- Chandrayaan 1 support

Upcoming Activities / Dataset Releases

- VEX first data release planned for August. Five instruments: VMC, SOIR, VIRTIS, SPICAV and MAG
- Rosetta first data release in preparation
- Rosetta SPICE data set ready for release
- MEX SPICE Review ongoing
- SMART-1 AMIE data review
- Updated PSA WWW area
- BepiColombo data handling and archive support

PSA and the PDS collaboration

- ❑ **It was decided at an early stage that PSA data would comply with PDS Standards:**
 - To maximise the cross-compatibility of ESA and NASA data
 - Existing and well established standard in the community

- ❑ **We have good contact and excellent support from several of the PDS Nodes:**
 - MEX: Geosciences. MOU between ESA and NASA
 - Rosetta: Small Bodies Node. International mission.
 - VEX: Atmospheres Node. *Interoperability*. Review support.

- ❑ **Our experiences with the development of our archives (especially with the development of our validation tool) has highlighted several inconsistencies in the PDS Standards and the way in which various PDS colleagues interpret them**

- ❑ **These 'lessons learned' might be used by the IPDA to help develop a refined set of IPDA recommendations for archiving that will allow for international archive interoperability.**

PSA / PDS Standard 'Divergence'

- **Noted issues the IPDA would do well to address / avoid. A few PSA/PDS examples:**
 - TARGET_NAME / TARGET_TYPE linking. What's the point?
 - Node to Node variations in 'strictness'
 - Ambiguous dictionary definitions / keywords
 - Line lengths, 72 or 80 or both?
 - <CR><LF> formatting
 - TARGET catalog - one object per catalog. They already exist and **MUST** be used!

- **Verification tool(s) and readers?**
 - We need a 'universally' accepted validation tool or set of tools, currently:
 - NASAView compatibility ok? Tbttool?
 - PVV acceptance (i.e. PSA compliance) does not mean PDS compliance, if you interpret the Standards in certain ways!
 - PDS vtool and lvtool throw different errors and are not used consistently.

Other Issues

- Incomplete deliveries to the scientific community as calibrated data deliveries are not available in time by some experimenter teams on the on-going planetary missions

- Mars Express Independent Review clearly indicated
 - the need to distribute calibrated data
 - the need to distribute basic visualizing software

- Insufficient resources within some of the experimenter teams

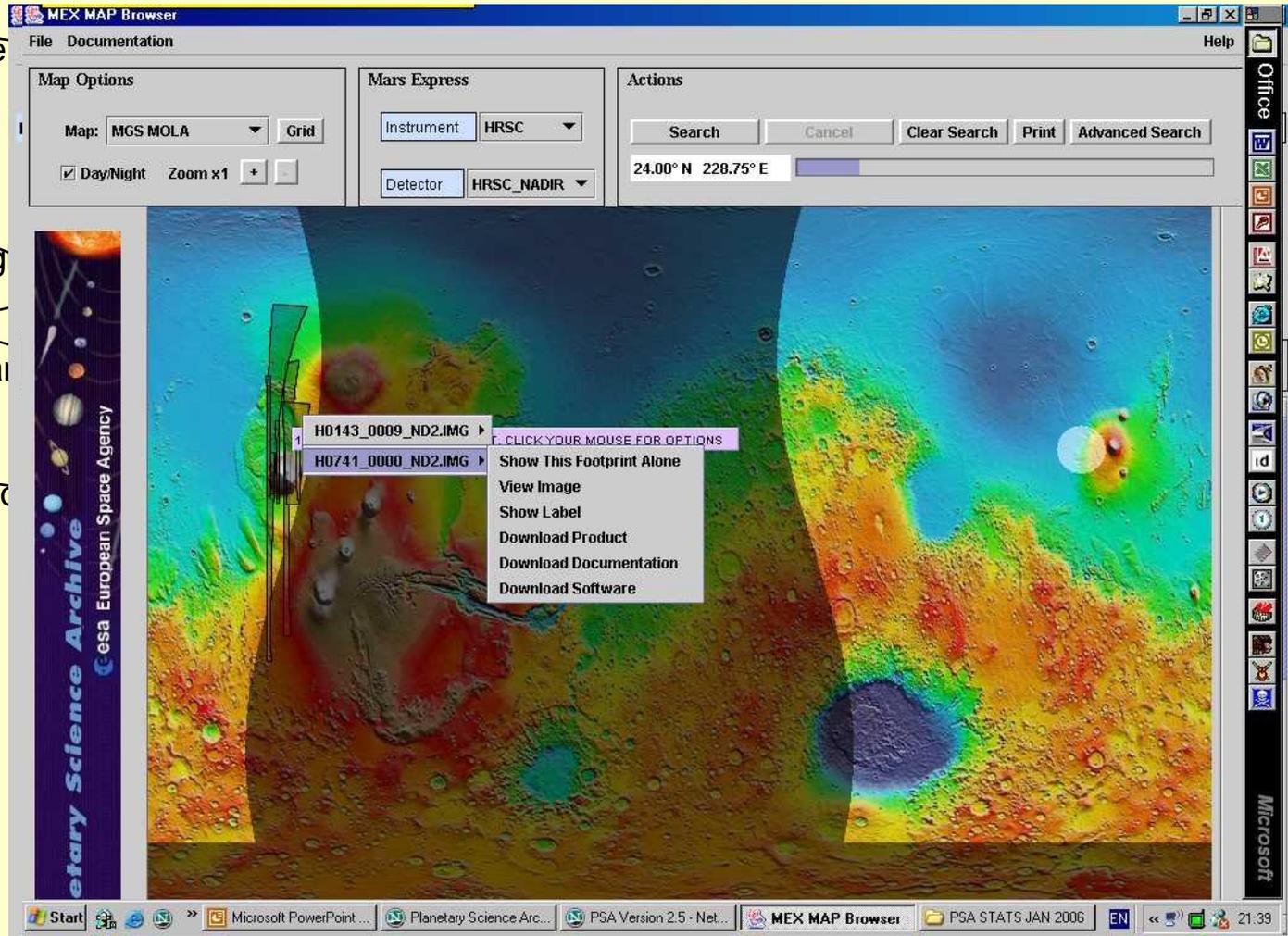
- Parallel activities in member states

Lessons Learned

- ❑ **The PDS and PSA are diverging in many small ways due to ambiguities in the Standards or different interpretations**
 - Streamline the Standards and remove any unclear or ambiguous wording.
 - If there are any *requirements* for successful interoperability, clearly indicate them! Avoid loose terminology.
- ❑ **Consistency between data sets is very difficult internally**
 - Discussions on keyword definitions are endless
 - Discussion with dictionary entity are lengthy
 - Discussions with team members to use the same keywords and values need quite some time, e.g. Can different mapping instruments on the same S/C use the same geometrical information?
 - Consistent interpretation of Standards
 - More comprehensive and 'universally' accepted validation tools are required.
- ❑ **How do we stay up to date with evolving Standards?**
- ❑ **Most/some data producers are not funded adequately for the job they have to do!**

PSA UI – The Map Interface

1. Click on the Search Button (or drag to select your area of interest)
2. Press Search, and wait for the data to be accessed from the database. You search parameters will be used to find relevant data and sub-solar point for selected footprint.
3. Click on desired footprint
4. Download directly or view label / docs etc.



PSA Browser Interface

Opening Screen

Click on the instrument that interests you

Select the data set you wish to look at

Browse through the directories to locate the files you want

Right click the product you want to save etc. to bring up the menu

Left click to view directly (where possible)

```

PDS_VERSION_ID      = PDS3
RECORD_TYPE         = STREAM
FILE_RECORDS        = 103208

DATA_SET_ID         = "MEX-M-ASPERA3-2-EDR-NPI-V1.0"
STANDARD_DATA_PRODUCT_ID = "NPINORM_C_ACC"
PRODUCT_ID          = "NPINORM20053271022C_ACC01"
PRODUCT_TYPE        = "DATA"
PRODUCT_CREATION_TIME = 2006-08-15T19:29:32
RELEASE_ID           = 0023
REVISION_ID         = 0000

START_TIME          = 2005-327T10:22:24.828
STOP_TIME           = 2005-327T11:14:24.056
SPACECRAFT_CLOCK_START_COUNT = "1/0080821339.61538"
SPACECRAFT_CLOCK_STOP_COUNT = "1/0080824459.10952"

INSTRUMENT_HOST_NAME = "MARS EXPRESS"
INSTRUMENT_HOST_ID   = "MEX"
MISSION_PHASE_NAME   = "MR Phase 8"
MISSION_NAME         = "MARS EXPRESS"
TARGET_NAME          = "MARS"
TARGET_TYPE          = "PLANET"
ORBIT_NUMBER         = 2391
INSTRUMENT_NAME      = "ANALYZER OF SPACE PLASMA AND ENERGETIC ATOMS (3RD VERSION)"
INSTRUMENT_ID        = "ASPERA-3"
PRODUCER_ID          = "SJEFFERS"
PRODUCER_FULL_NAME   = "SANDEE JEFFERS"

NOTE                 = "
NPINORM20053271022C_ACC01.CSV contains Mars Express ASPERA-3 data
from the Neutral Particle Imager (NPI) in c/acc sampled in the
energy range of 0.1 keV to 60 keV.
The file covers the time period 2005-327 10:22:24.828 to
2005-327 11:14:24.056 (orbit(s) 2391)."
```

```

DESCRIPTION          = "
This file contains data for NPINORM: Neutral Particle Imager (NPI)
normal instrument mode (NORM). There are 32 azimuthal sectors and
data are sampled in the energy range of 0.1 keV to 60 keV. Each row
contains a single data value (SENSOR) in c/acc corresponding to one
of the 32 azimuthal sectors, followed by a data quality indicator.
The NPI Instrument is stationary (not rotating) for this data - the
ASPERA-3 scanning unit is parked and has not yet been turned on.
Please refer to the Data Set Catalog, ASPERA3_EDR_NPI_DS.CAT,
for detailed information about data organization, science meaning,
data quality determination, data modes, etc."
```

```

^SPREADSHEET         = "NPINORM20053271022C_ACC01.CSV"
```

- [OPE](#), Optical Probe Experiment (PI: A. Weisenberger)
- [PIA](#), Particle Impact Analyzer (PI: J. Kissel)
- [RPA](#), Copernic Plasma Experiment

Applet esa.gst.gui.applet.GSTApplet started