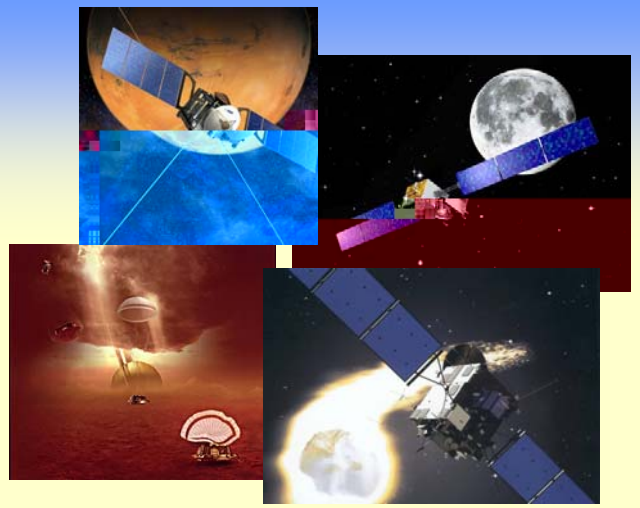
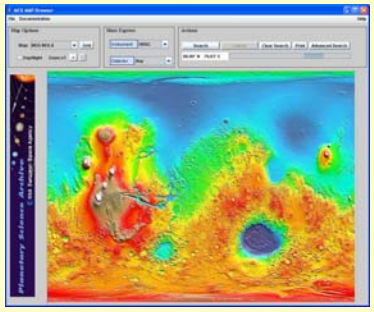


ESA Planetary Science Archive

Christophe.Arviset@esa.int

Science Archives and VO Team

ESA – ESAC – Madrid, Spain



European Space Astronomy Centre

- ESAC default location for:
  - Science operations,
    - long history with astronomical missions,
    - now expanding with solar system missions.
  - Science archives,
    - Astronomy
    - Planetary
  - ESA VO activities,
    - ESAC to be the European VO node for space-based astronomy.

http://www.esa.int/SPECIALS/ESAC/

Located near Madrid, Spain

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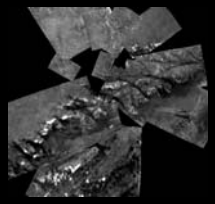
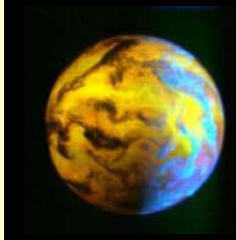
Research & Scientific Support Department

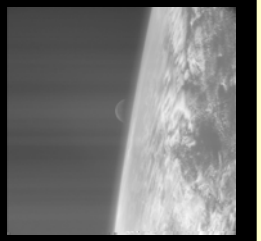
PSA : one archive, several missions

Huygens

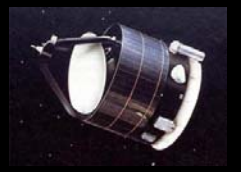


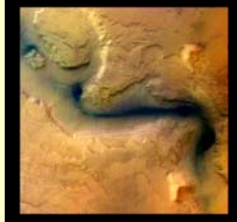


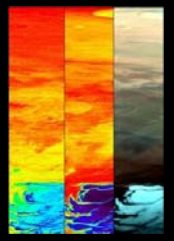
Rosetta



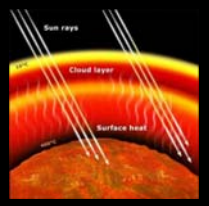
Giotto



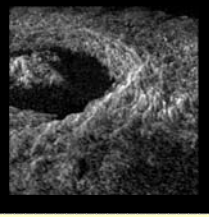


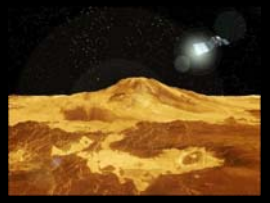


Mars Express

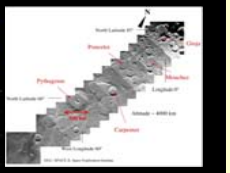


Venus Express





Smart-1



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Planetary Science Archive

- Available since March 2004:
  - http://www.rssd.esa.int/PSA
- Active development, PSA 2.7 on 2nd August 2006

- PSA Team @ ESA-ESTEC (NL)
  - Archive Scientist, setting up the requirements
  - Interface with Instrument Teams
  - Validating DataSets

- PSA Team @ ESA-ESAC (Spain)
  - PSA systems software development

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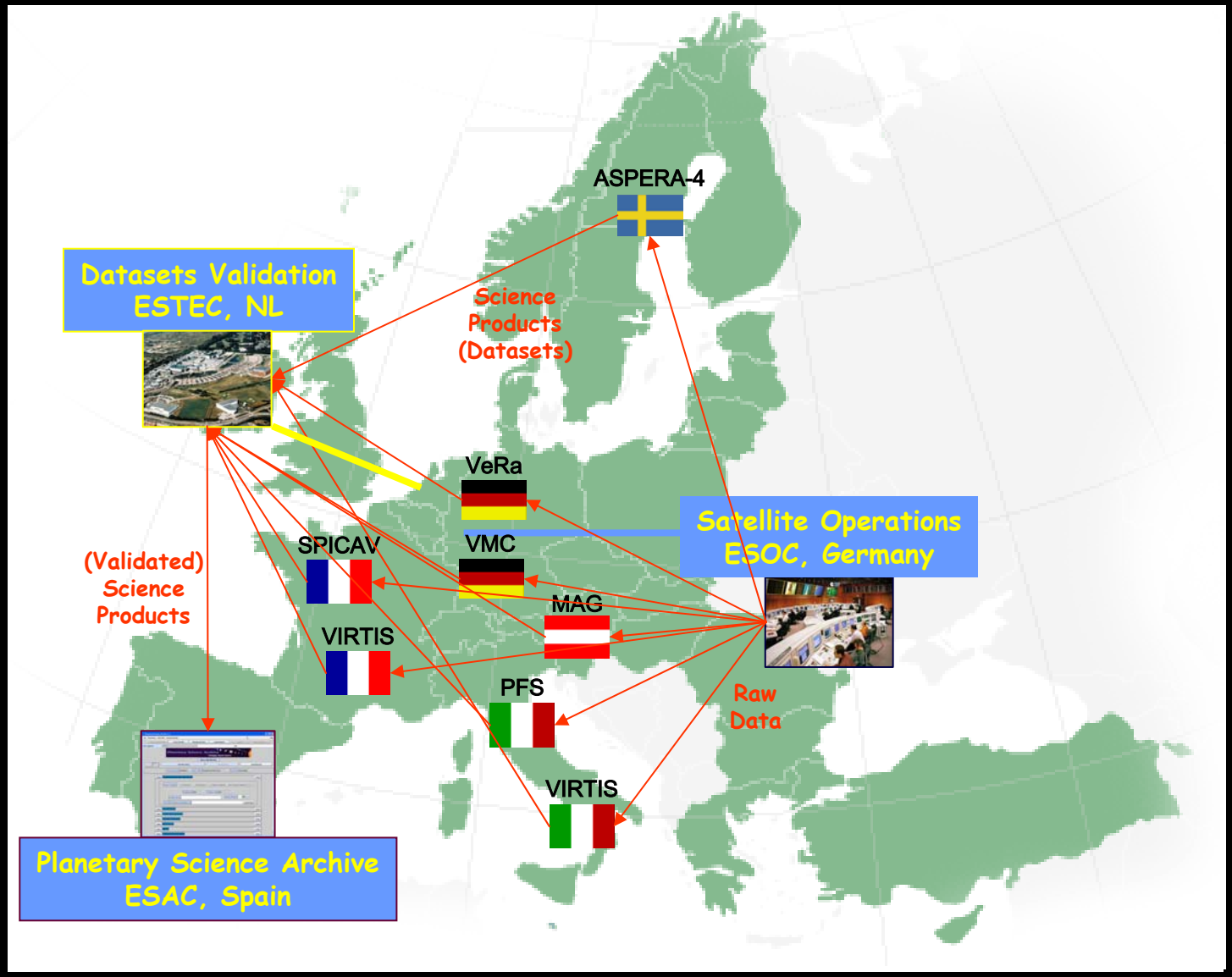
Data Flow for Venus Express (1/3)

Data Flow for Venus Express (2/3)

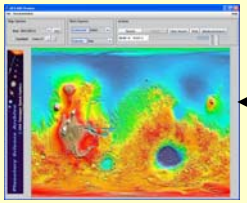


Data Flow for Venus Express (3/3)

An open 3-tier architecture :

Separate the Data from the Presentation

Standard GUI



Map Based GUI

External Archives / Applications

Inter-operability Module

Middle Tier (Java / XML)

Business logic:
access to database
access to data products

Meta Data in Database

DB Ingest

Data Products on hard disks

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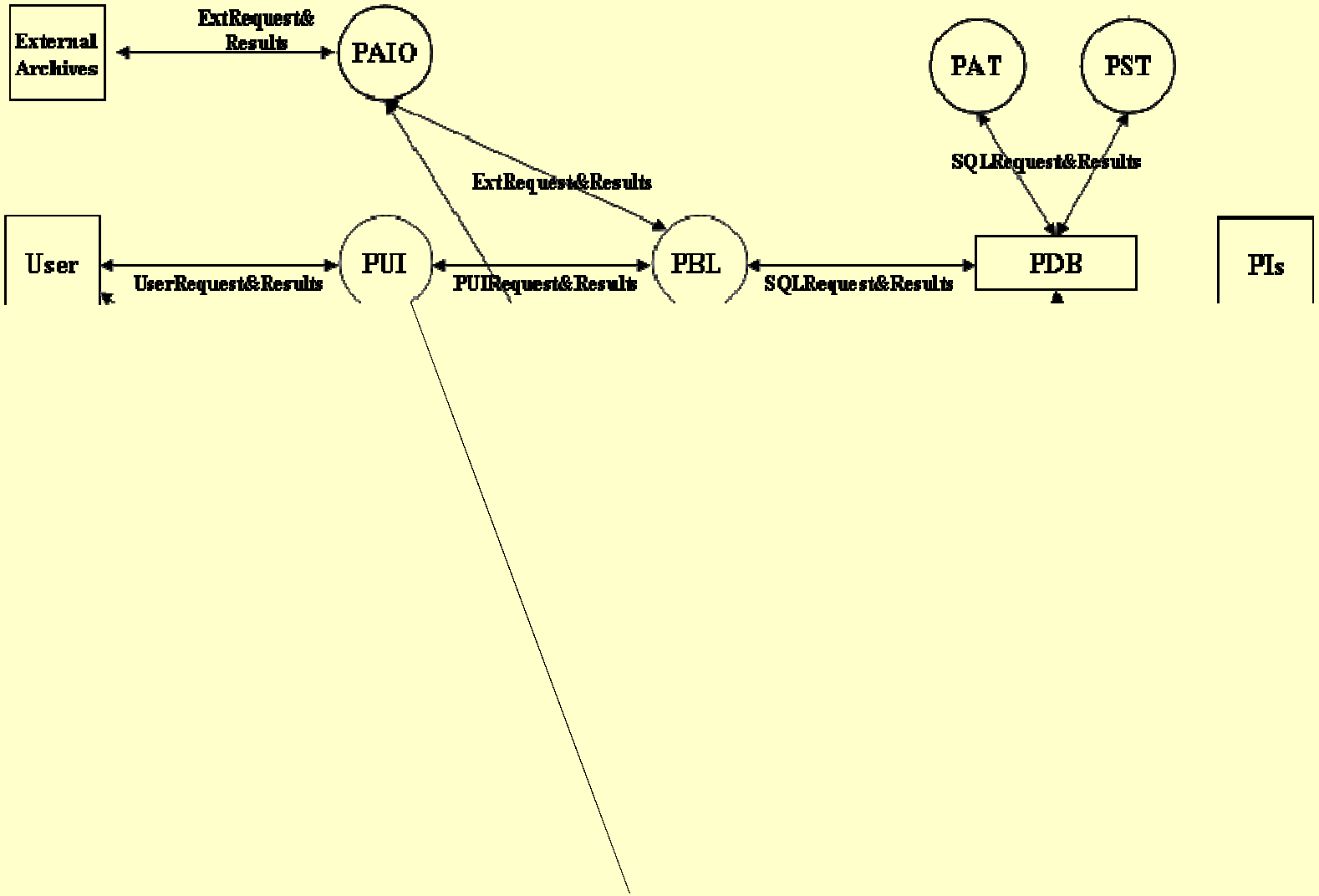
PSA Top Level System Design



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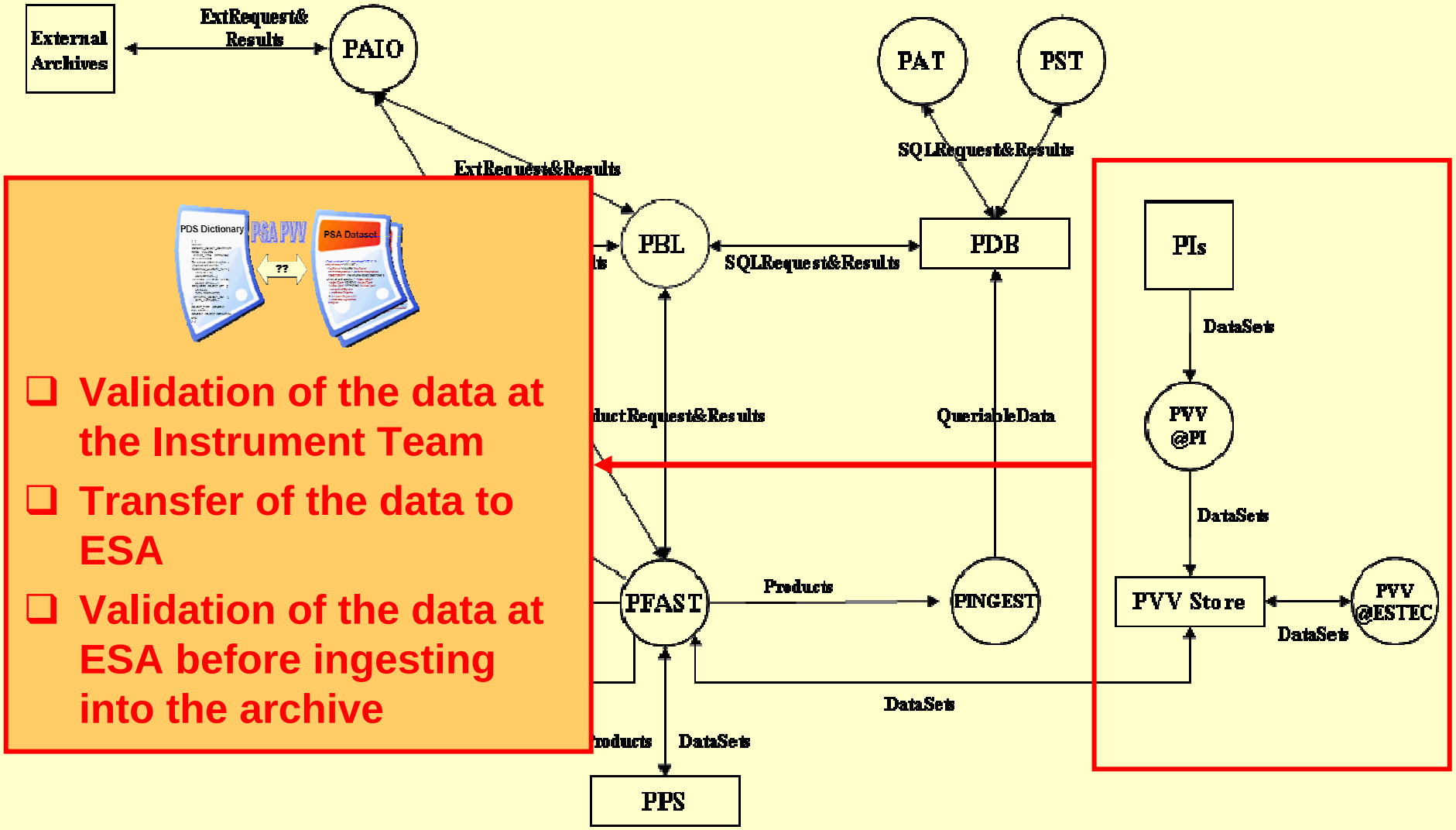
PSA Data Validation : PVV



- Validation of the data at the Instrument Team
- Transfer of the data to ESA
- Validation of the data at ESA before ingesting into the archive

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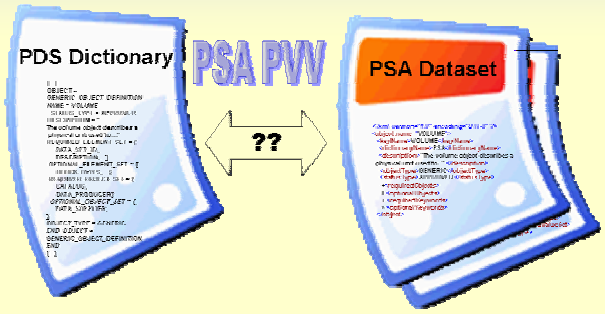
Datasets Validation

- PVV : Stands for PSA Volume Verifier.



- Dataset produced by various Instrument Teams
- Need to validate and verify any volume dataset according to:
  - Planetary Data System standards reference (PDS, NASA).
  - Specific PSA constraints and extensions.
- PVV ensures PDS/PSA compliancy in all datasets accessible from PSA.
  - PVV distributed to Instrument Teams for pre-validation
- PVV first released in Nov 2003 (currently v2.7 in October 2006).
- Command-line tool developed 100% in Java (J2EE and XML)
- Runs on Windows, Mac and Unix/Linux like platforms.

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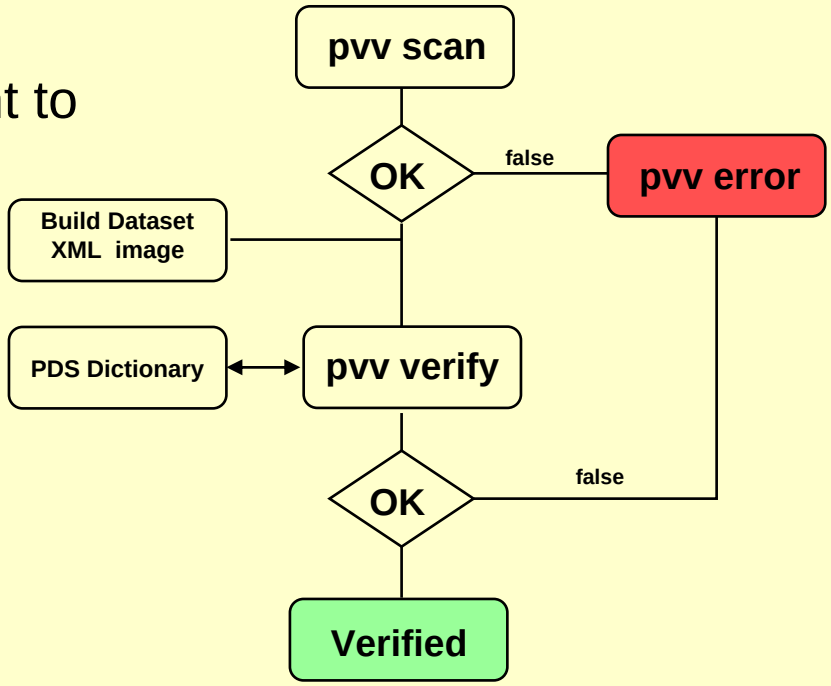
PVV features

- Two main commands:
  - PVV SCAN
    - Scan dataset structure and builds XML dataset image.
    - Checks structure to be compliant to PDS directory structure.
  - PVV VERIFY
    - Verifies compliancy of dataset contents according to PDS standard and PSA dictionary definitions.
    - Performs integrity checks (PSA specific).



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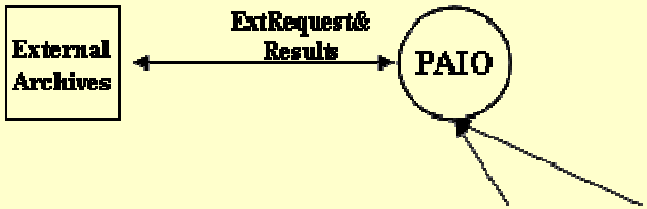
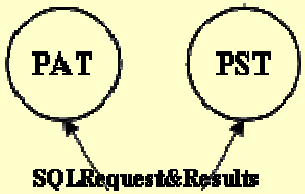
PSA Back-end Systems





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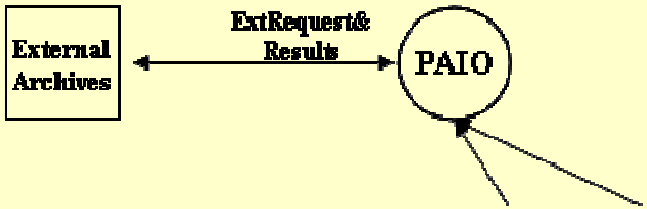
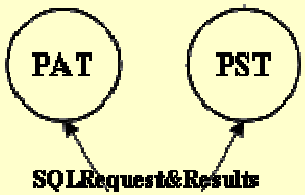
PSA Back-end Systems





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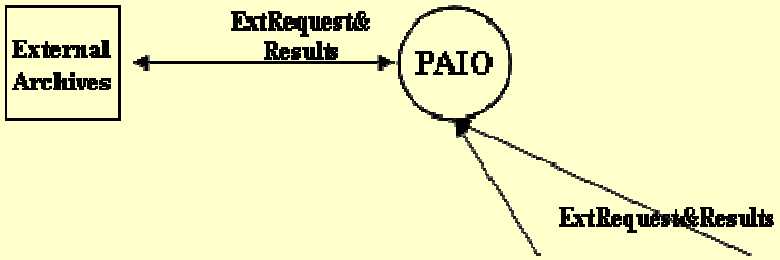
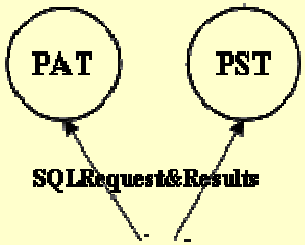
PSA User Interfaces





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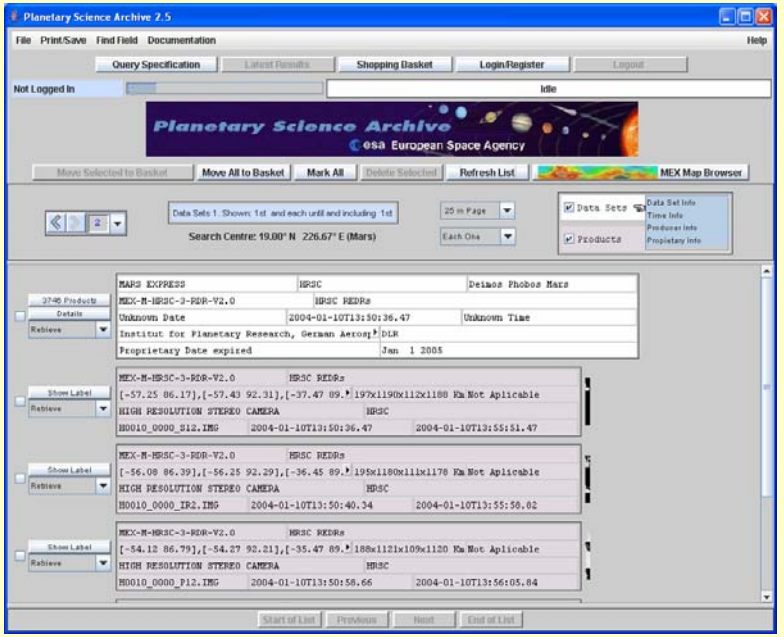
PSA Standard User Interface

- User friendly web access : Java Applet
  - http://www.rssd.esa.int/PSA
- Powerful queries, organized by panel
  - General query panels
  - Mission / instrument specific panels
- Hierarchical data presentation
  - 1 Dataset -> several dataproducts
- Public data accessible to all, proprietary data accessible only to privilege users
- Images preview (icons, full image)
- Quick download (1 click) at various processing levels, shopping basket retrieval



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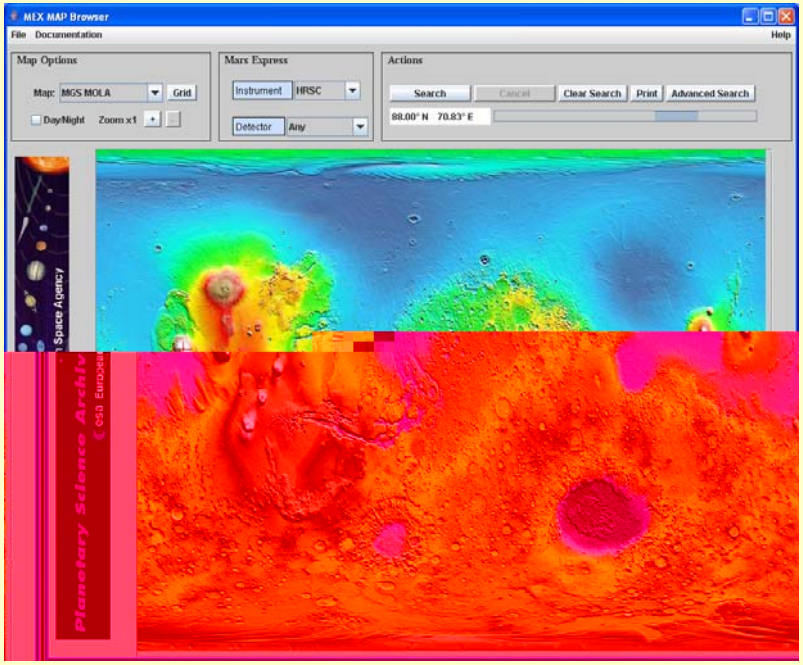
PSA Mars Map Based Interface

- Interface for Mars Express Camera data
  - http://www.rssd.esa.int/PSA
  - Java Applet
- No need to be an expert
  - Easy for general public
- Area selection by mouse
  - Display images footprints
- Image download by 1 mouse click
  - Some are big (be patient!)
- Go back and forth to the standard interface



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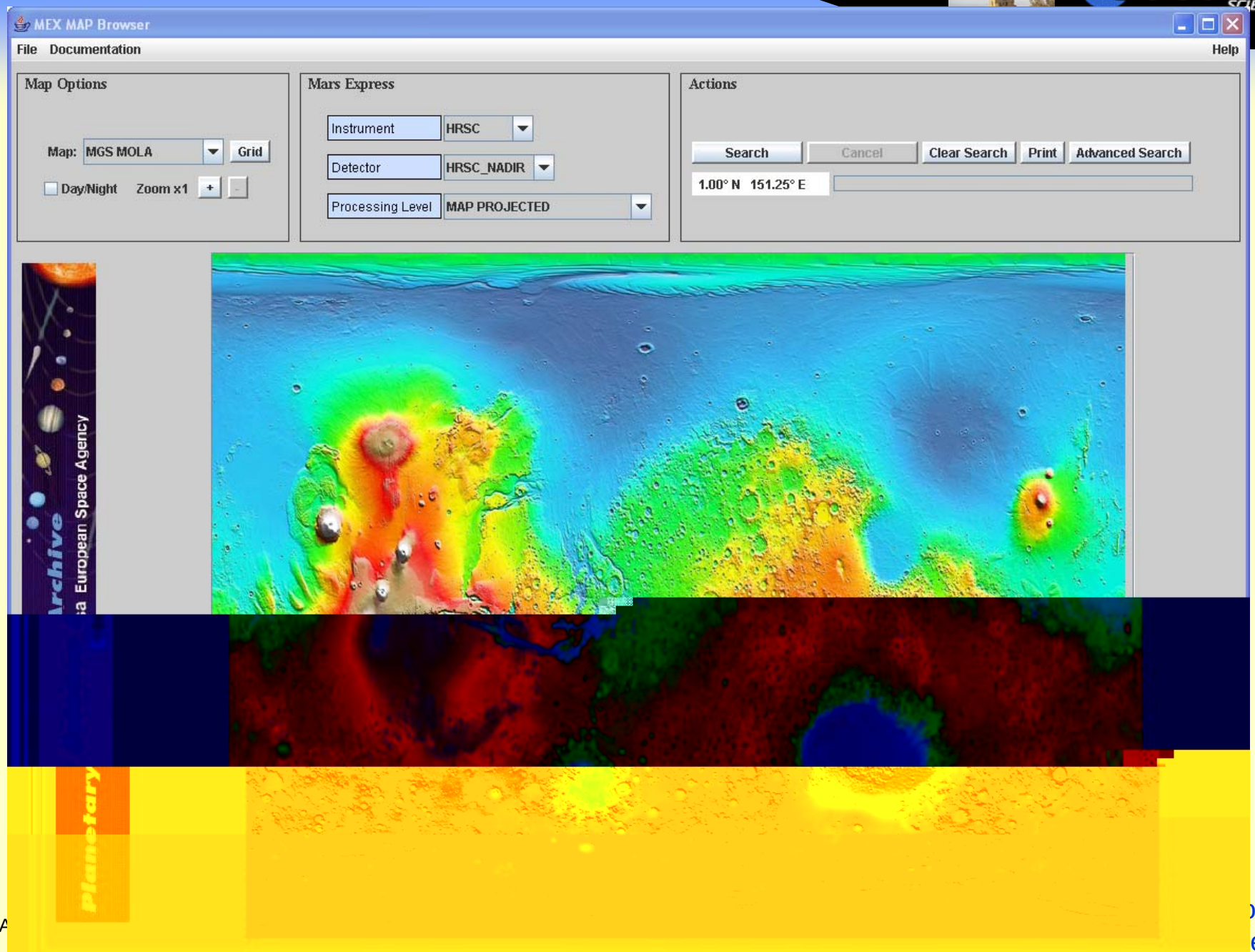
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Map Options
Map:
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Advanced Search
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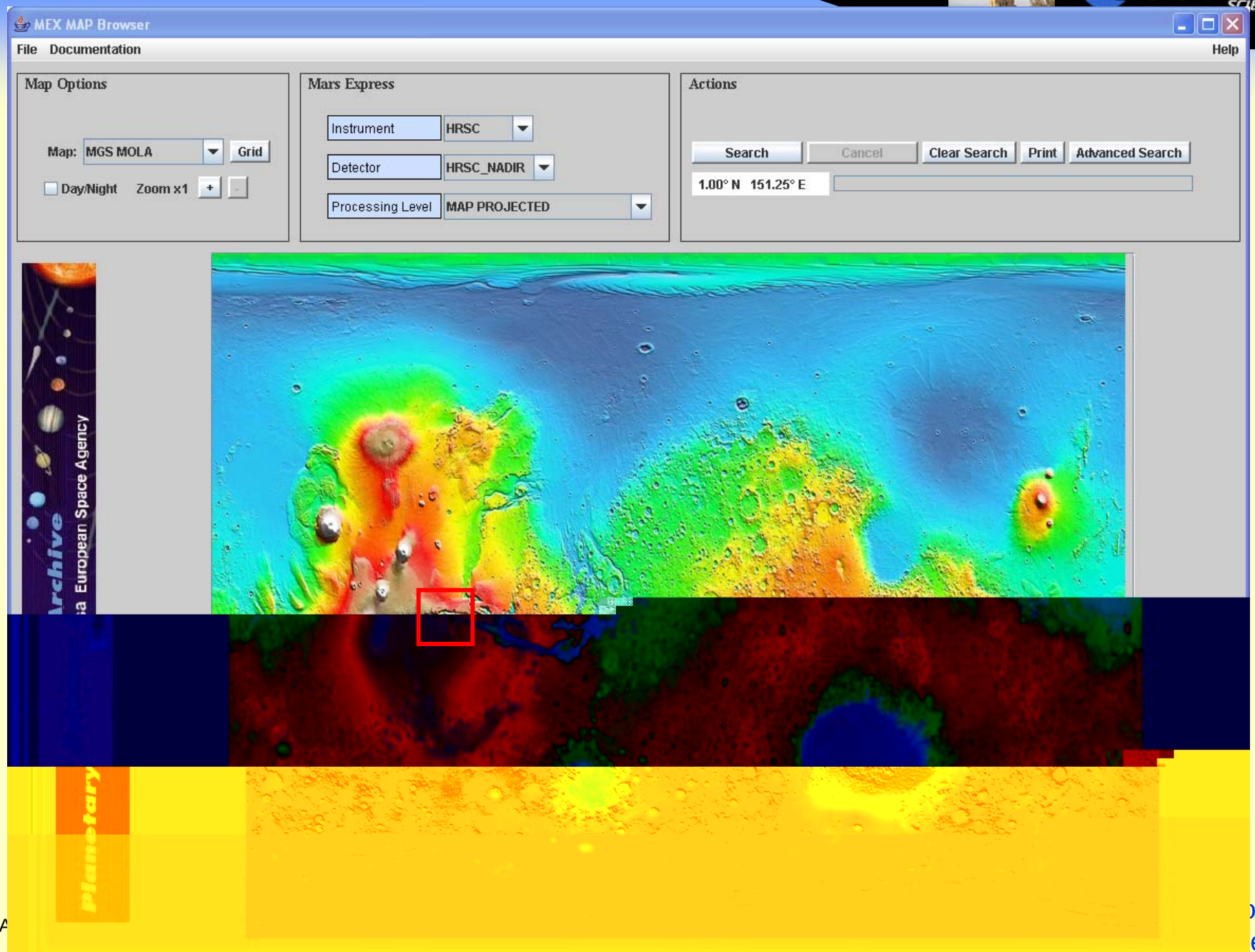
European Space Agency
Planetary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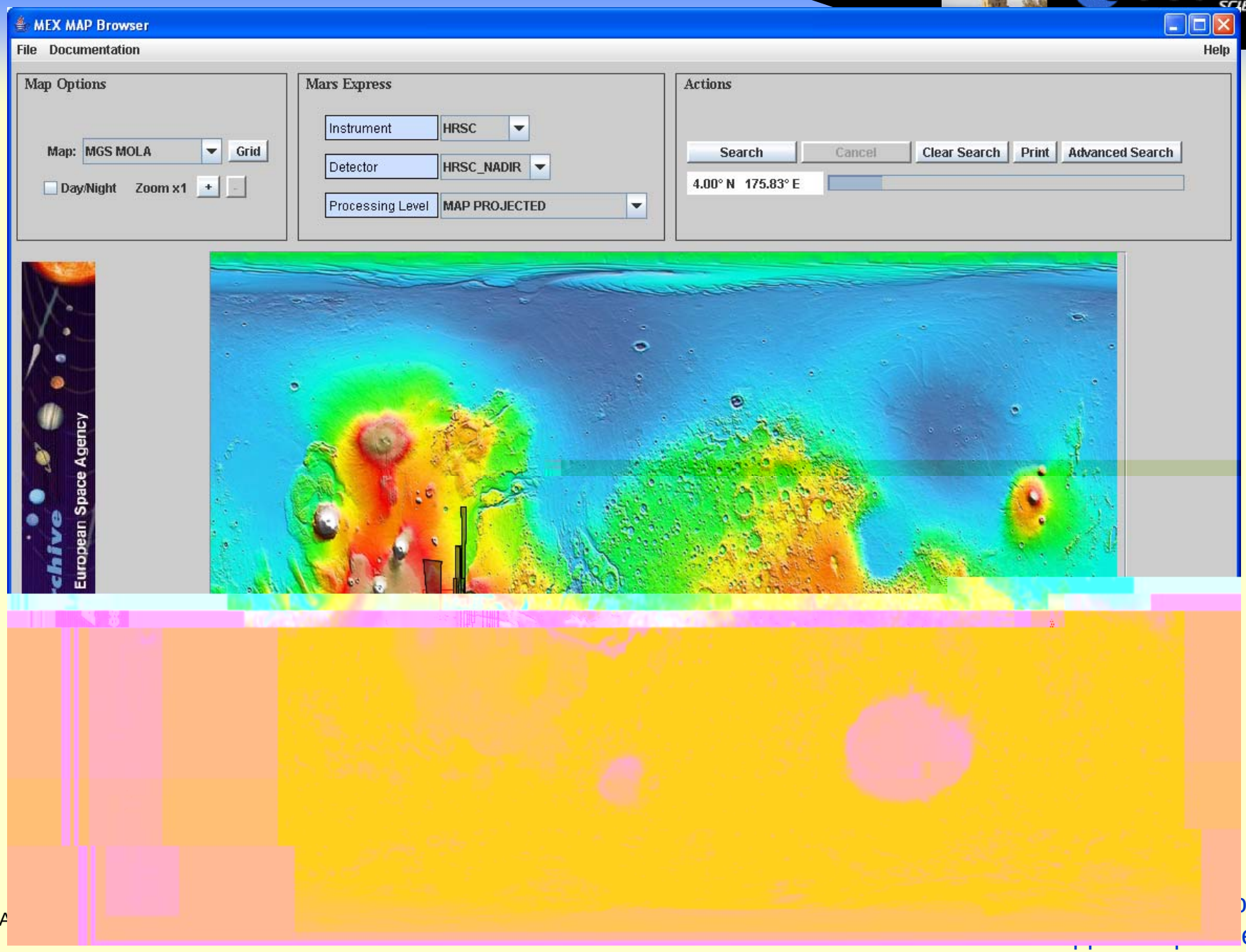
European Space Agency
Planetary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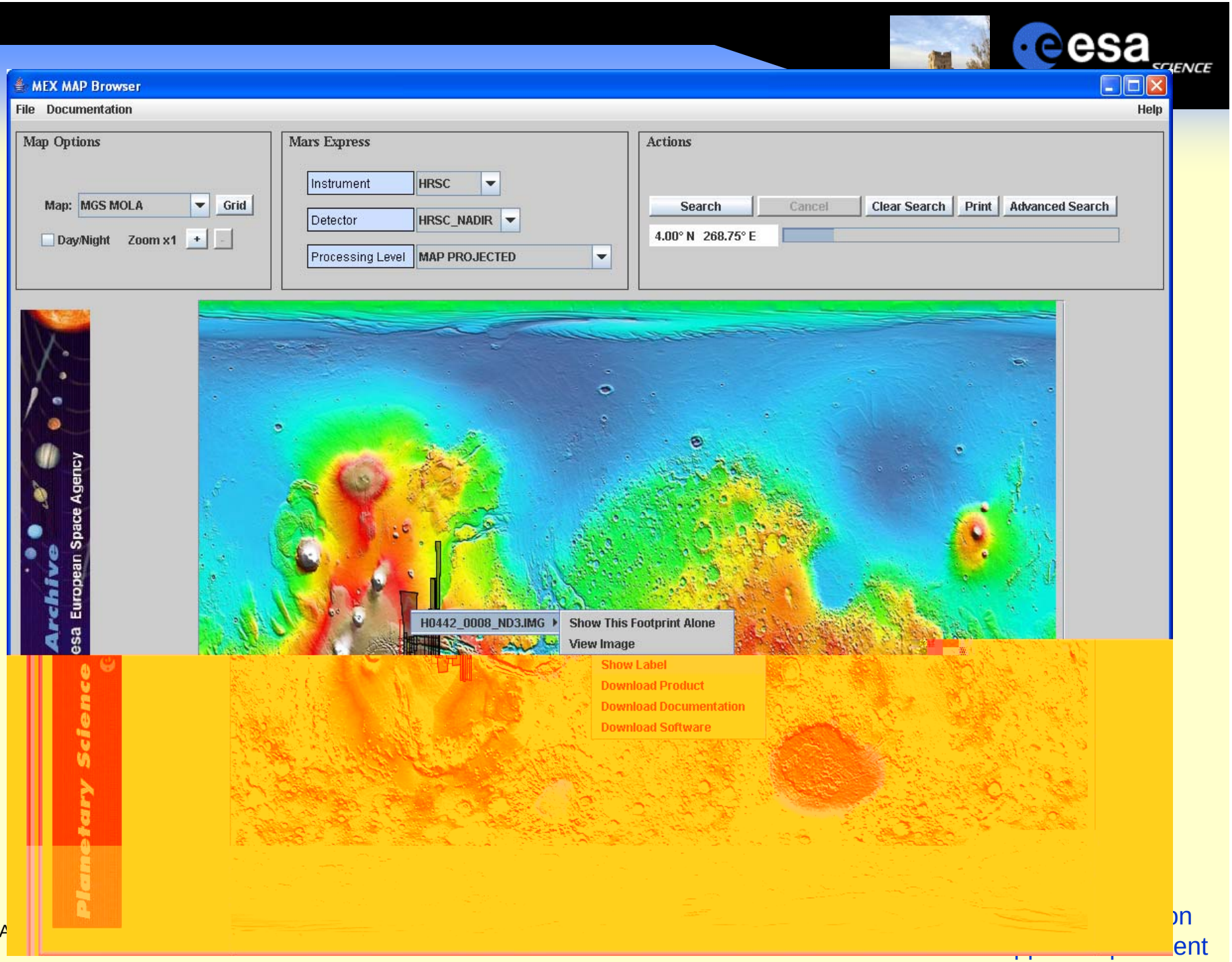
European Space Agency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Show Label
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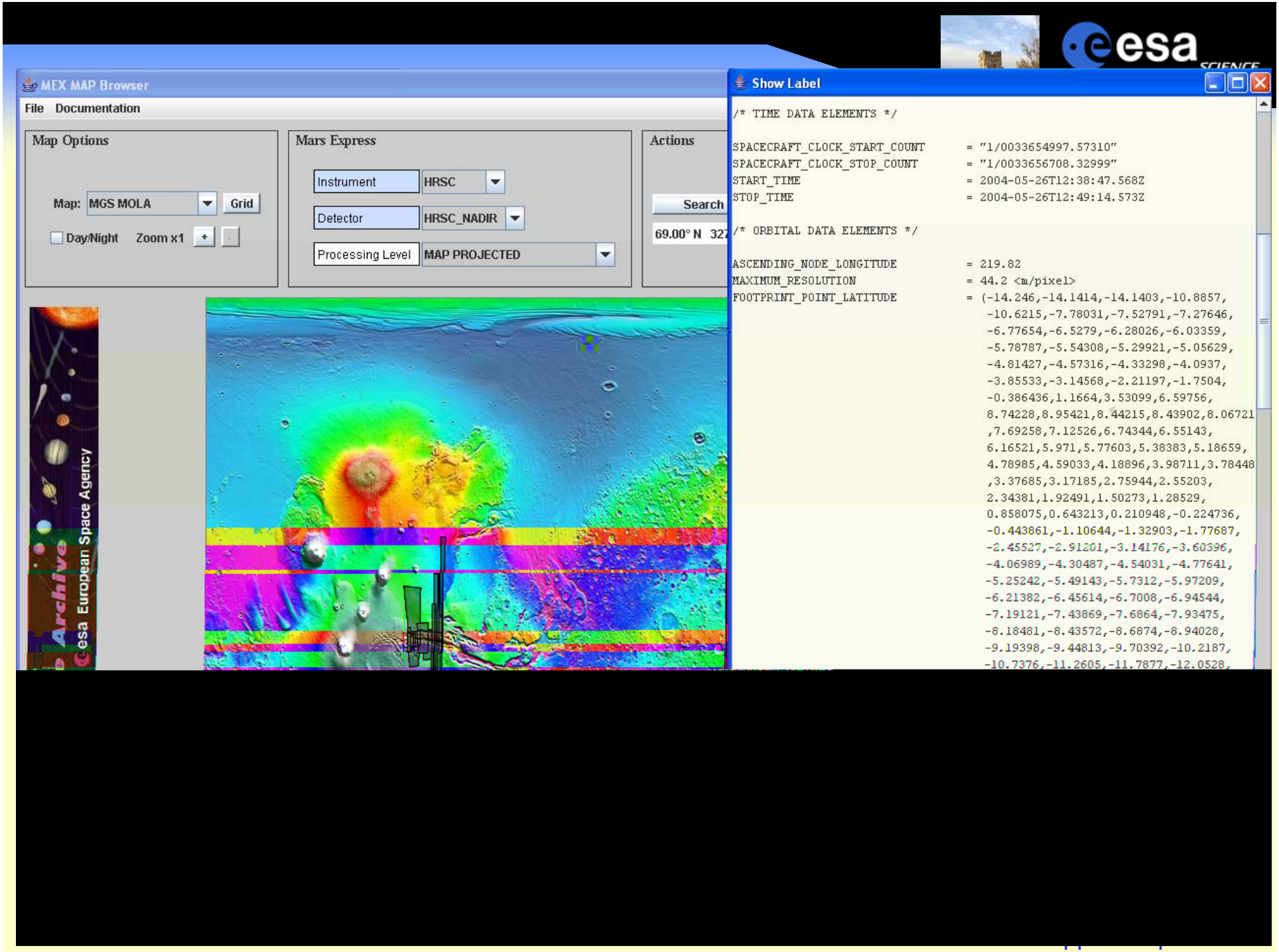
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Detector
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Processing Level
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esa European Space Agency
Archive
Show Label
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SPACECRAFT_CLOCK_START_COUNT = "1/0033654997.57310"
SPACECRAFT_CLOCK_STOP_COUNT = "1/0033656708.32999"
START_TIME = 2004-05-26T12:38:47.568Z
STOP_TIME = 2004-05-26T12:49:14.573Z
/* ORBITAL DATA ELEMENTS */
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MAXIMUM_RESOLUTION = 44.2 <m/pixel>
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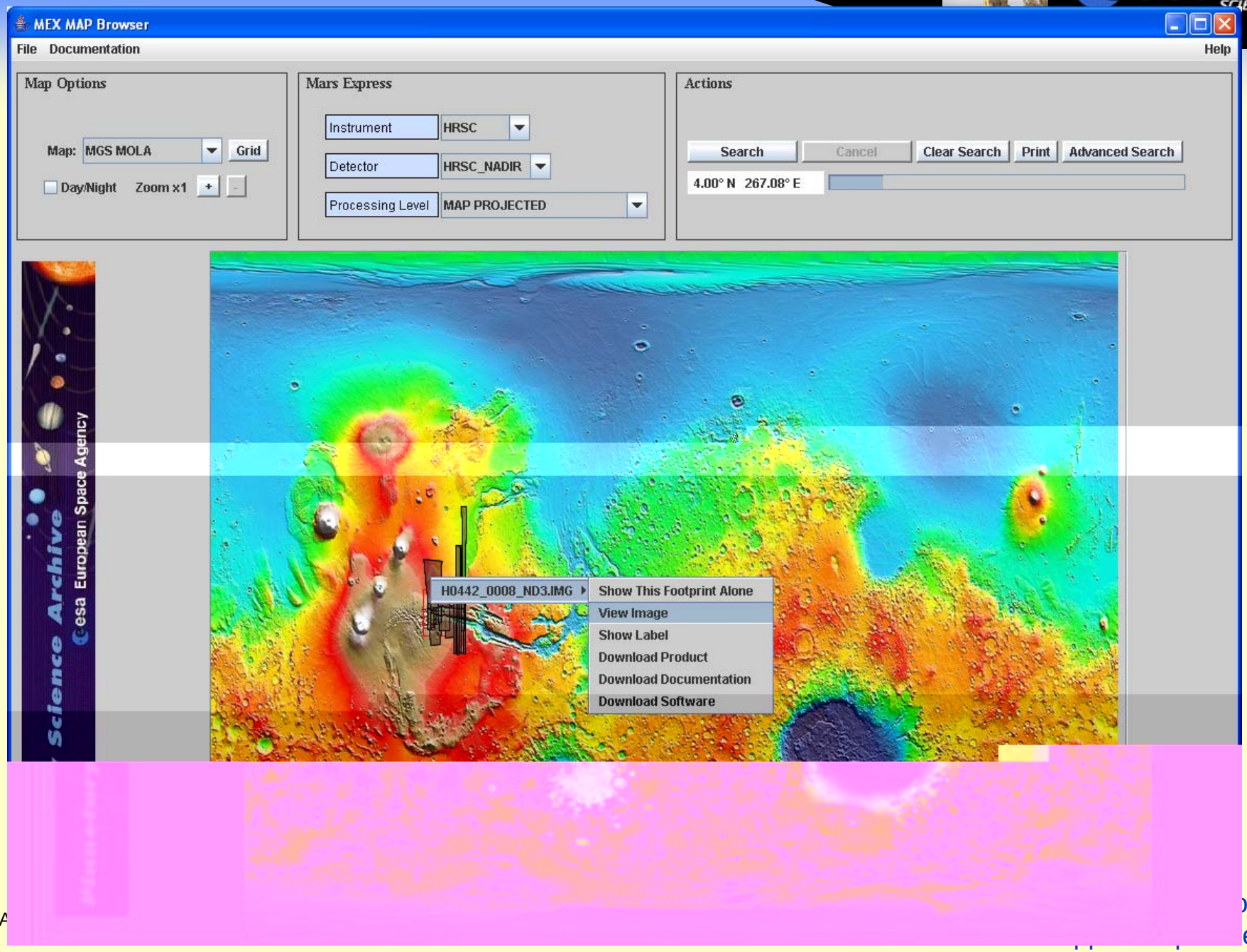
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Show Label
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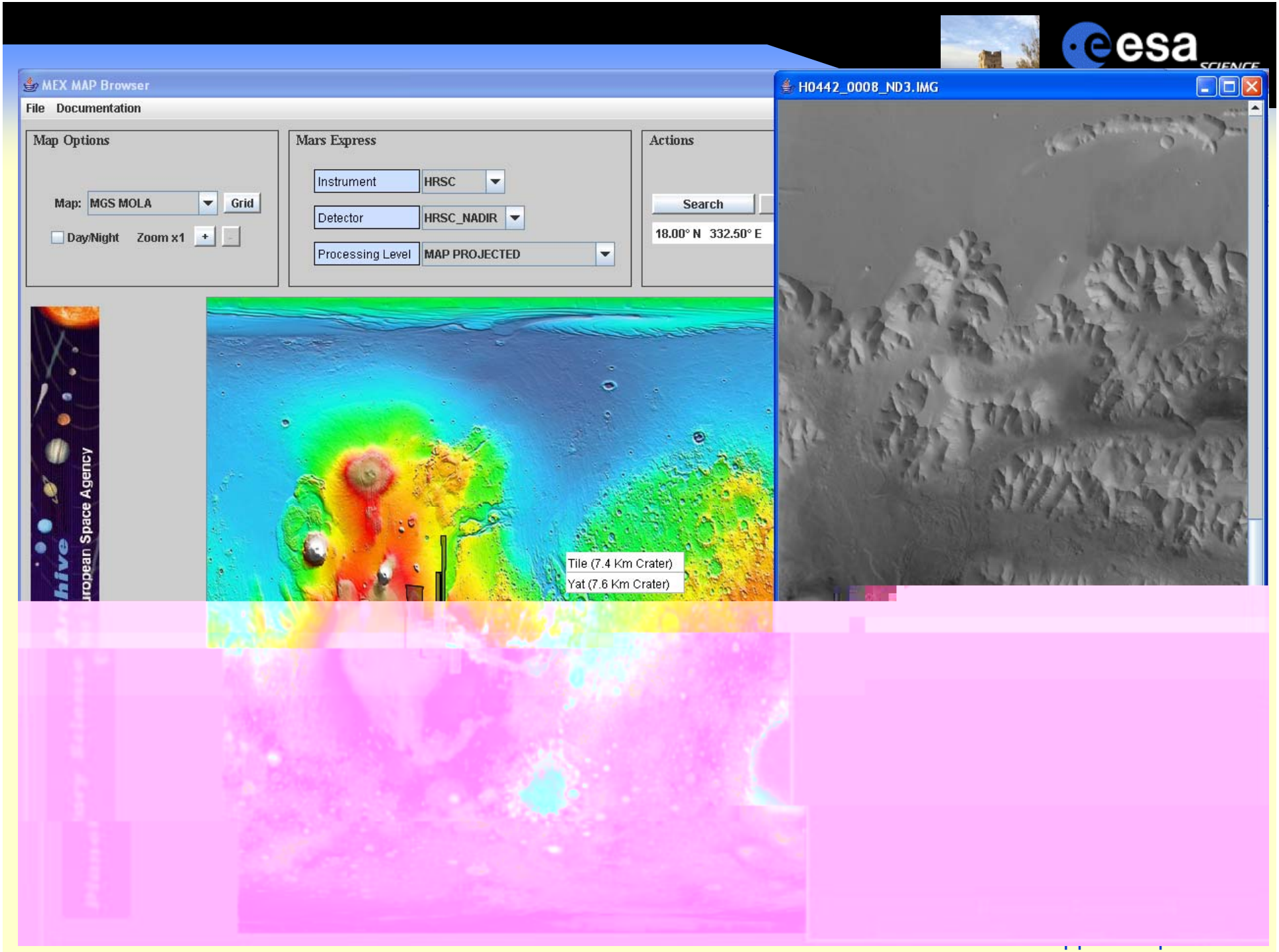
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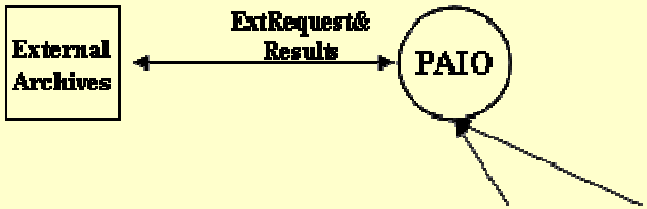
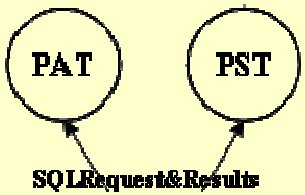
Tile (7.4 Km Crater)
Yat (7.6 Km Crater)
European Space Agency

PSA Inter-operability





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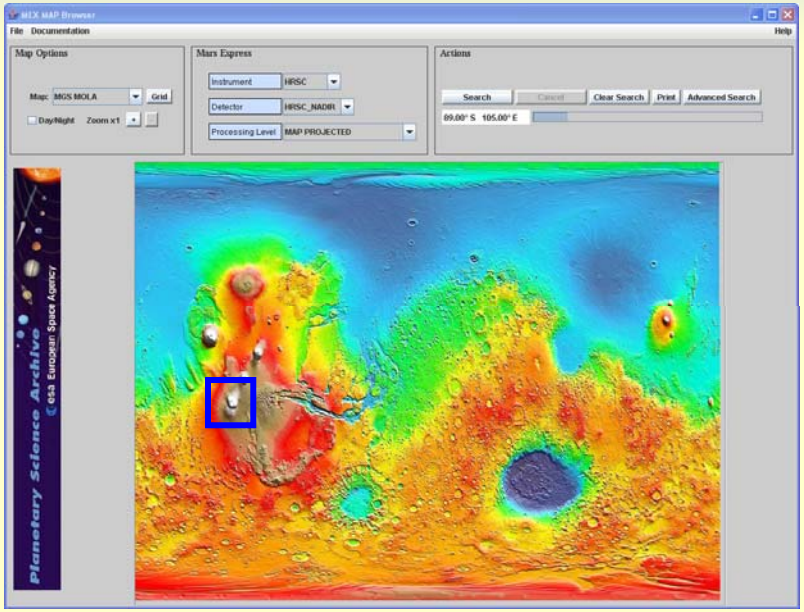
Interoperability ESA PSA – NASA PDS



- (Prototype in development)
- From Mars Map Browser, Select region of interest

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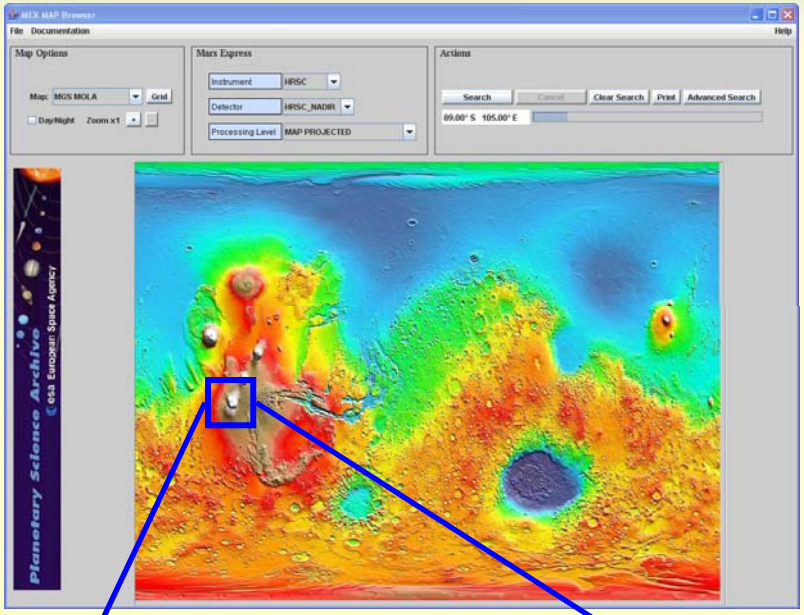
Interoperability ESA PSA – NASA PDS



- (Prototype in development)
- From Mars Map Browser, Select region of interest
- Contact PSA and PDS using the PDAP (Planetary Data Access Protocol)
  - Re-use of IVOA DAL experience
  - Adapted to PDS

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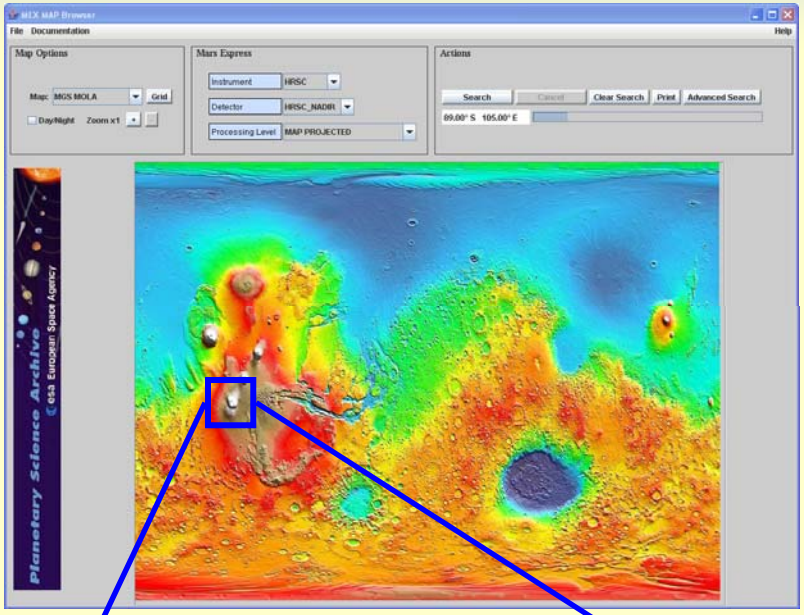
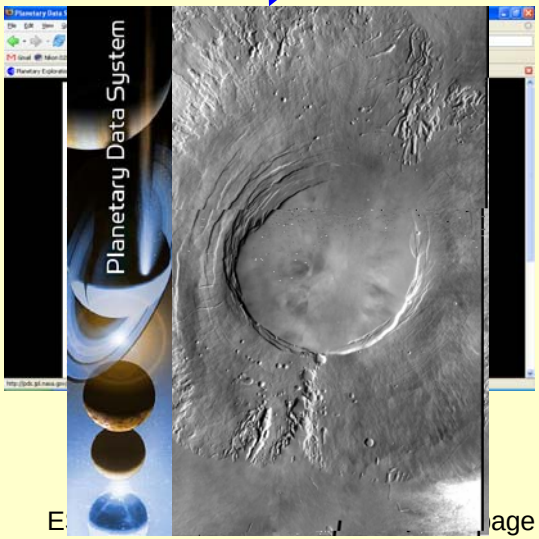
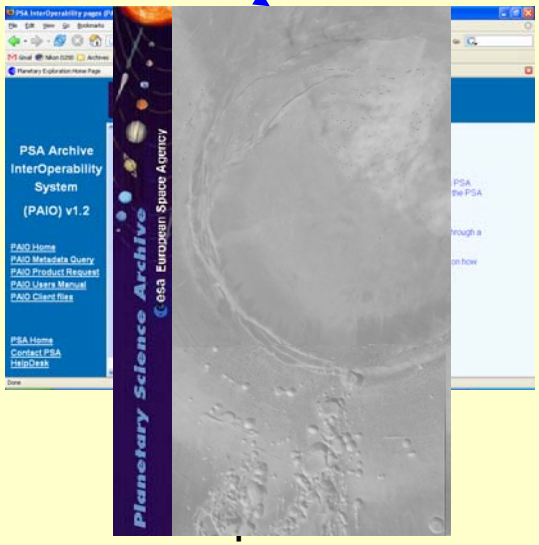
Interoperability ESA PSA – NASA PDS







- (Prototype in development)
- From Mars Map Browser, Select region of interest
- Contact PSA and PDS using the PDAP (Planetary Data Access Protocol)
  - Re-use of IVOA DAL experience
  - Adapted to PDS
- Display NASA PDS and ESA PSA images

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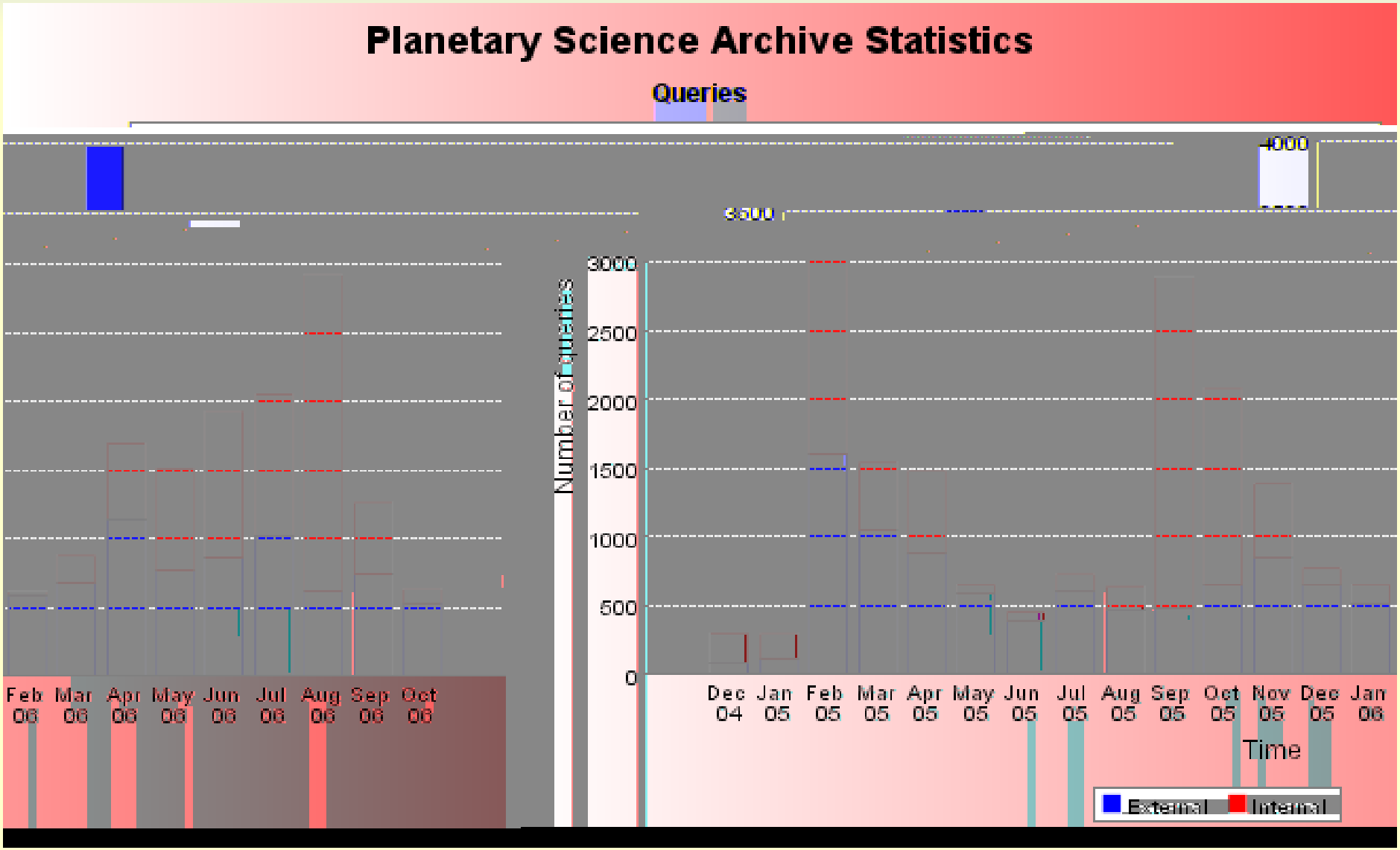
Some Statistics - queries



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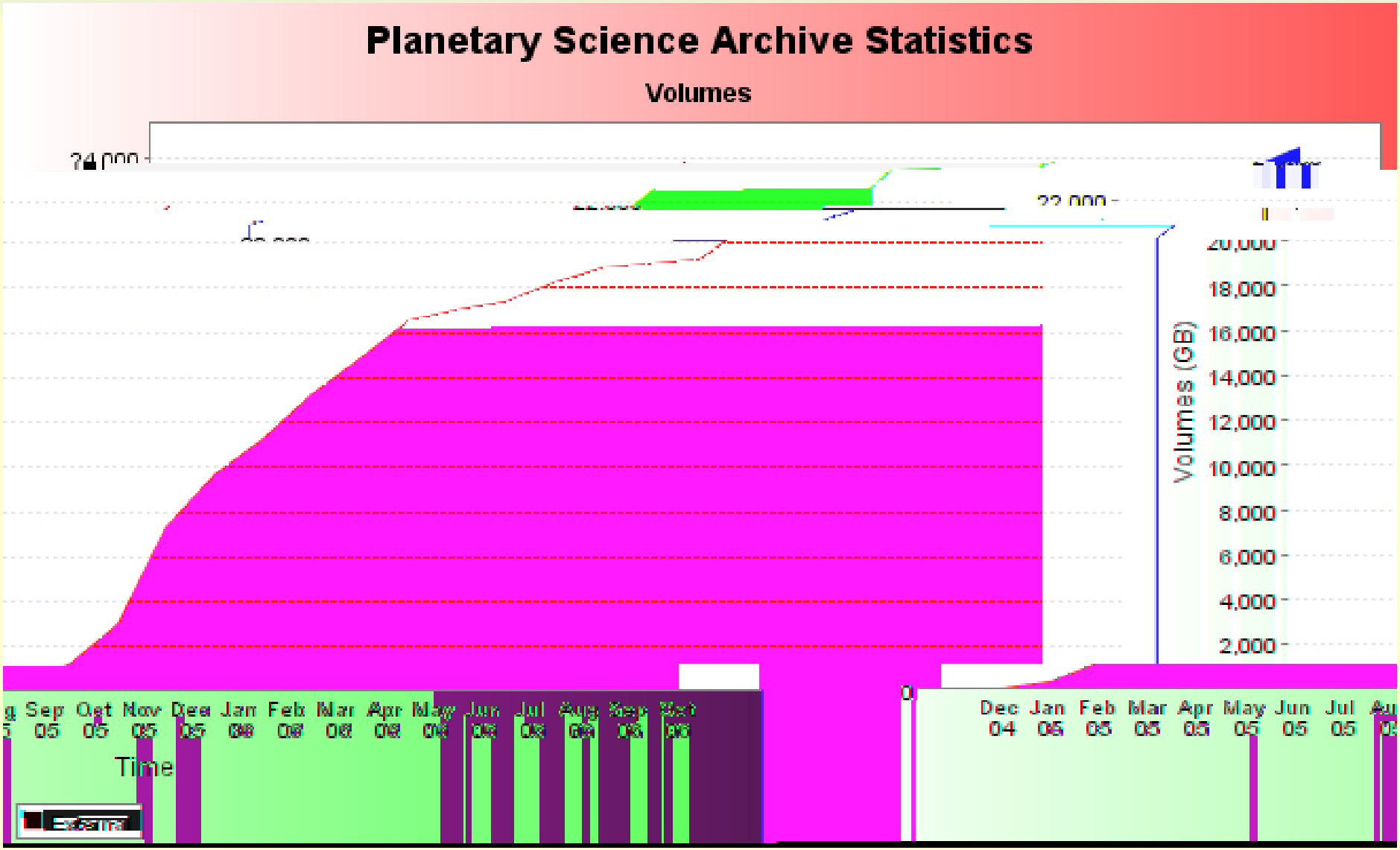
Some Statistics - volume



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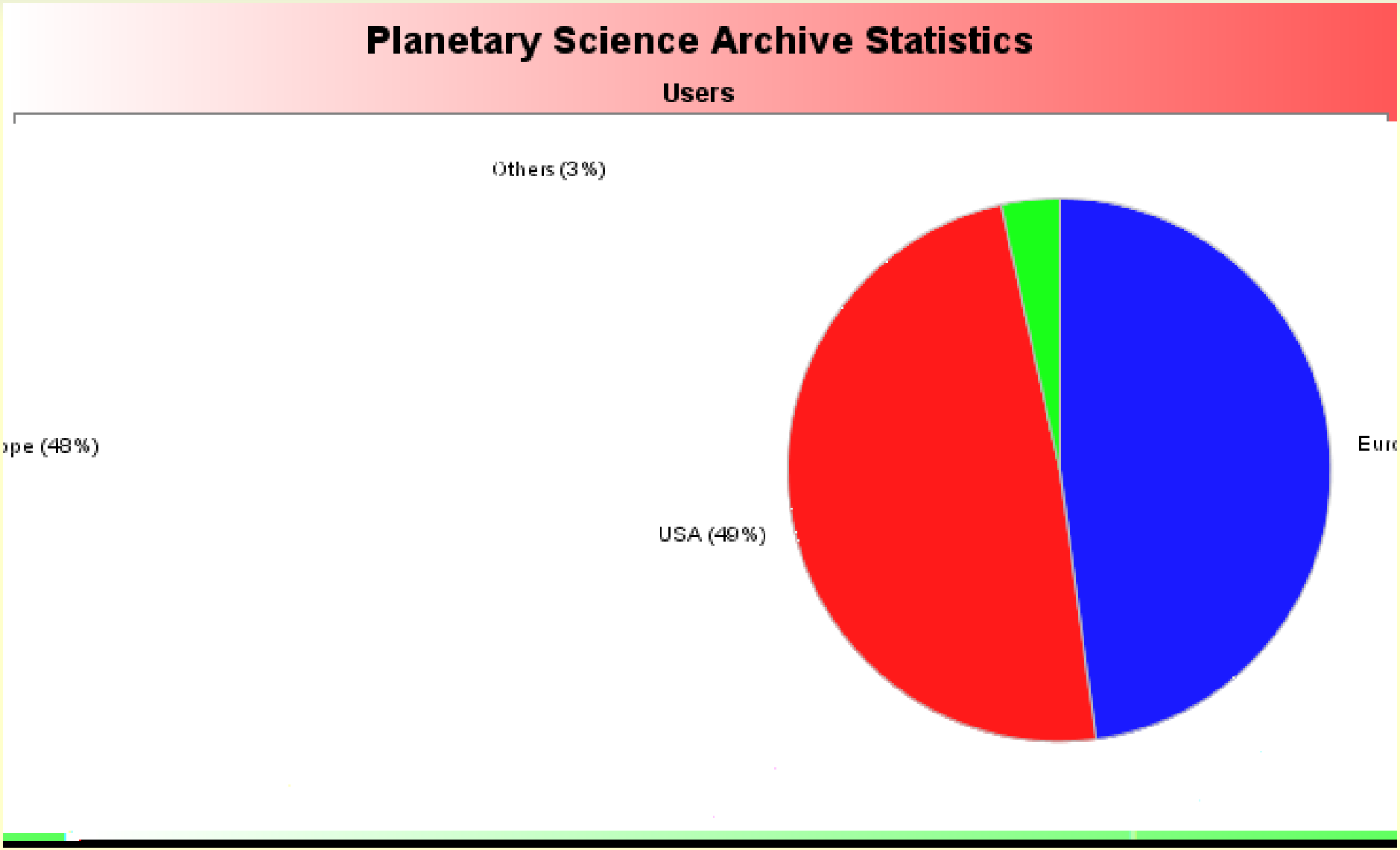
Some Statistics - users



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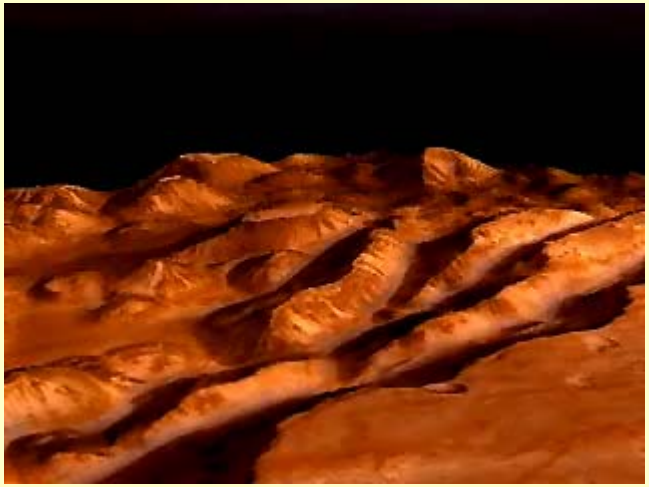

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