

# Integrated environment for simulation access and visualization : an extension of SPASE proposed by the TEMPETE project, R. Modolo, V. Génot et al

- Goals :
- Investigate the response of planetary exosphere and magnetosphere to solar extreme events (CME, CIR, ...)
  - Mars / Mercury / Earth



Starting point - IMPEX FP7 project (2011 – 2015)

The use of a unified protocol to share information :

- ✘ A standard/unique dictionary for describing observations and simulations
- ✘ Standard methods for data analysis and machine to machine exchange
- ✘ Standard formats



Evolution of the SPASE/IMPEX data model for TEMPETE

- ✘ Accounting for specificities linked to the an Exospheric (upper atmosphere) Global Model
  - ✘ New type of inputs: neutral quantities
  - ✘ New geometry: spherical coordinates
- ✘ Accounting for time dependent simulations
  - ✘ Use InputTableURL to refer to the VOTable containing time series of inputs
  - ✘ StopDate=StartDate for individual snapshot
- ✘ For chained models (coupled simulations)
  - ✘ add InputResourceID to InputPopulation

Simple Type `enumProduct`

Namespace	http://impex.lamtos.ipsl.fr
Annotations	Product type of the simulation results
Diagram	
Type	restriction of <code>xsd:string</code>
Facets	<ul style="list-style-type: none"><li>Enumeration <code>3DCubes</code></li><li>Enumeration <code>3DSpheres</code></li><li>Enumeration <code>2DCuts</code></li><li>Enumeration <code>2DShells</code></li><li>Enumeration <code>TimeSeries</code></li><li>Enumeration <code>SpatialSeries</code></li><li>Enumeration <code>Lines</code></li><li>Enumeration <code>Spectra</code></li></ul>
Used by	Element <code>SimulationProduct</code>

# A (prototype) catalog of Exospheric Simulation database connected to VO-Tools (TopCat and 3Dview)

The screenshot shows the Latllys web interface. On the left, a data tree lists simulation folders like 'Simulations' and 'EGM\_Merc\_30\_08\_20@Latmos\_Exospheric\_Simulation\_1'. A red circle highlights the 'SAMP' icon. A green box highlights the 'dataProduct' section. The main panel displays 'Data Information' (Product Type: 2DShells, MeasurementType: NeutralGas), 'Run Information' (EGM\_Merc\_30\_08\_20, Simulated Region: Mercury), and 'Basic SimulationRun description' (Domain, Min Cell Size, True Anomaly Angle). A 'Download' button is highlighted with a blue box, and a message indicates 'Sending 1D/2D data product to TopCat'.

Capability to load a 3DSphere (ex : Na Density in Mercury environment) in 3Dview (CNES/CDPP/GFI)  
 Webservices to propose new fonctionnalités (in progress) :

- ✗ getColumnDensity
- ✗ getShellCut

Capability to visualize time dependent simulation (in progress)

