



Virtual Exploitation Environment Demonstration for Atmospheric Missions

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The scientific and industrial communities are being confronted with a strong increase of Earth Observation (EO) satellite missions and related data. This is in particular the case for the Atmospheric Sciences communities, with the upcoming Copernicus Sentinel-5 Precursor, Sentinel-4, -5 and -3, and ESA's Earth Explorers scientific satellites ADM-Aeolus and EarthCARE. The challenge is not only to manage the large volume of data generated by each mission / sensor, but to process and analyze the data streams. Creating synergies among the different datasets will be key to exploit the full potential of the available information.

As a preparation activity supporting scientific data exploitation for Earth Explorer and Sentinel atmospheric missions, ESA funded the "Technology and Atmospheric Mission Platform" (TAMP) [1] [2] project; a scientific and technological forum (STF) has been set-up involving relevant European entities from different scientific and operational fields to define the platform's requirements. Data access, visualization, processing and download services have been developed to satisfy user's needs; use cases defined with the STF, such as study of the SO₂ emissions for the Holuhraun eruption (2014) by means of two numerical models, two satellite platforms and ground measurements, global Aerosol analyses from long time series of satellite data, and local Aerosol analysis using satellite and LIDAR, have been implemented to ensure acceptance of TAMP by the atmospheric sciences community.

The platform pursues the "virtual workspace" concept: all resources (data, processing, visualization, collaboration tools) are provided as "remote services", accessible through a standard web browser, to avoid the download of big data volumes and for allowing utilization of provided infrastructure for computation, analysis and sharing of results. Data access and processing are achieved through standardized protocols (WCS, WPS).

As evolution toward a pre-operational environment, the "Virtual Exploitation Environment Demonstration for Atmospheric Missions" (VEEDAM) aims at maintaining, running and evolving the platform, demonstrating e.g. the possibility to perform massive processing over heterogeneous data sources.

This work presents the VEEDAM concepts, provides pre-operational examples, stressing on the interoperability achievable exposing standardized data access and processing services (e.g. making accessible data and processing resources from different VREs).

[1] TAMP platform landing page <http://vtpip.zamg.ac.at/>

[2] TAMP introductory video <https://www.youtube.com/watch?v=xWiy8h1oXQY>