Technology and Atmospheric Mission Platform
TAMP

Stefano Natali, TAMP Project Manager (SISTEMA GmbH)
TAMP Portal and Services

Support of scientific access and use of past, current and future Atmospheric science data

- **Data:**
  - Model data
  - Ground measurements
  - Satellite data

- **Services:**
  - Social portal for discussions and results sharing
  - Data access and view services
  - Processing / data assessment services
  - Download (data, graphs) service
Data Management

- **Volume**: Data at rest
- **Velocity**: Data in motion
- **Variety**: Data in many forms
- **Veracity**: Data in doubt

- Raster data (model, satellite, lidar) : WCS
- Ground Measurements: SQL
## Compatible data formats

<table>
<thead>
<tr>
<th>Data type</th>
<th>Format</th>
<th>Dimensionality</th>
</tr>
</thead>
<tbody>
<tr>
<td>AERONET data</td>
<td>Ascii</td>
<td>Dimensionality</td>
</tr>
<tr>
<td>ALARO model data</td>
<td>GRIB</td>
<td>3D</td>
</tr>
<tr>
<td>AROME model data</td>
<td>GRIB</td>
<td>3D</td>
</tr>
<tr>
<td>BASCOE</td>
<td>netCDF</td>
<td>3D</td>
</tr>
<tr>
<td>CAMS</td>
<td>netCDF</td>
<td>2D / 3D</td>
</tr>
<tr>
<td>Cloudsat</td>
<td>Hdf</td>
<td>“2D”</td>
</tr>
<tr>
<td>EEA (SO2)</td>
<td>Ascii</td>
<td>1D</td>
</tr>
<tr>
<td>EVDC</td>
<td>Hdf</td>
<td>1D</td>
</tr>
<tr>
<td>FLEXPART model output</td>
<td>Binary</td>
<td>3D</td>
</tr>
<tr>
<td>GOME level 2</td>
<td>Hdf</td>
<td>2D</td>
</tr>
<tr>
<td>LIDAR</td>
<td>netCDF</td>
<td>“1D”</td>
</tr>
<tr>
<td>LIDAR Bira</td>
<td>Ascii</td>
<td>“1D”</td>
</tr>
<tr>
<td>MACC</td>
<td>netCDF</td>
<td>2D / 3D</td>
</tr>
<tr>
<td>MODIS - MOD07</td>
<td>Hdf</td>
<td>2D / 3D</td>
</tr>
<tr>
<td>OMI / GOME BIRA SO2 data</td>
<td>Hdf</td>
<td>2D / 3D</td>
</tr>
<tr>
<td>OMI AURA level 2 / level 3 SO2 and AOT</td>
<td>Hdf</td>
<td>2D</td>
</tr>
<tr>
<td>Parasol Land/Sea</td>
<td>Binary</td>
<td>2D</td>
</tr>
<tr>
<td>SCISAT ACE</td>
<td>netCDF</td>
<td>“1D”</td>
</tr>
<tr>
<td>Sentinel 5P</td>
<td>netCDF</td>
<td>2D</td>
</tr>
<tr>
<td>WRF-CHEM model data</td>
<td>netCDF</td>
<td>3D</td>
</tr>
</tbody>
</table>
The TAMP Portal

The TAMP Portal is a web-based platform designed to facilitate the exchange of data, information, and resources related to atmospheric sciences and technology. Its main objectives include:

- Providing a virtual working environment for researchers and scientists.
- Enhancing the accessibility and exploitation of atmospheric data.
- Improving satellite atmospheric composition algorithms.
- Offering tools for validation and verification activities.
- Combining data with models and ground-truth information.

To access the portal, visit the homepage and explore the sections titled "Data," "Visualization," "Processing," and "Conclusions." The portal also features a "User Page," "News Page," and an "Ingestion Page." The recent articles include:

- **SO2 Total Column analysis: MACC vs OMI L3 best daily pixel**
  - Posted by: Admin, 1 day, 17 hours ago
  - The availability of SO2 total column data from different sources allows comparing model (MACC) and satellite (OMI) data by means of the Spatial Correlation function.
  - read more...

- **MACC SO2 total Column re-analysis added**
  - Posted by: Admin, 2 days, 4 hours ago
  - A sample of MACC SO2 Total Column re-analysis data has been added: 3-hourly global data of SO2 Total Column for the period May 1 - 31 2010 can be seen, animated and processed via TAMP.
  - read more...
Ground measurement visualization
Lidar measurement visualization
2D data visualization
2D data animation
2D data overlay
3D data visualization
Beauty is a matter of taste ...
Power is a matter of performance
Data Processing tools

- Calculate Spatial Average
- Calculate Temporal Average
- Calculate Difference
- Calculate Sum

Create new Collection
(based on selected collection) by:
- Vertical integration
- Unit Conversion

Assessment tools
- Assess station correlation
- Assess spatial correlation
Data Processing tools

**Processes**

- Calculate Spatial Average
- **Calculate Temporal Average**
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The Project

The Portal

Data

Visualization

Processing

Conclusions

downloadDataCollection Function

Modified user-uploaded code

uploadDataCollection Function

Processing Configuration File

```json
{'inputCollectionName': 'OMI_L2_AOT367',
'max_lat': 80,
'max_lon': 20,
'min_lat': 45,
'min_lon': -20,
'start_date': '2010-05-01',
'end_date': '2010-05-09',
'workingDir': '/home/tamp/run_test1/',
'outputCollectionName': 'test collection – OMI 2x',
'source': 'SISTEMA',
'max_value':2,
'min_value':0,
'application':'AOT',
'measurement_unit':'NA',
'access':'AR',
'ipr':'IO2'}
```
Welcome to the TAMP-Wiki!

What is TAMP?
The TAMP project has the main scope of implementing a system that allows its users (mainly belonging to the science community) to access and exploit a virtual working environment in the field of atmospheric sciences with the aim to improve satellite atmospheric composition algorithms. The main purpose of the TAMP environment is to allow performing validation and verification activities, comparing satellite/retrieved information with model data and ground-truth information. Moreover, data processing capabilities are provided to combine data, create new collections and verify their accuracy.

Here you can find information about the:
- TAMP Portal
- Data Analysis and Validation Environment (DAVE)

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New Data Management Paradigm

**The Project**
- Access
- Exploring
- Processing
- Results
- Download

**New paradigm**
- Online services
- On local infrastructure

**Traditional**
- Access
- Download
- Exploring
- Processing
- Results

- Online services
- On local infrastructure

Technology and Atmospheric Mission Platform – TAMP
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2D data animation – vertically integrated collection