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Demo: ENES Data Space: an EOSC-enabled and cloud-based environment for climate data analytics

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The exponential increase in data volumes and complexities is causing a radical change in the scientific discovery process in several domains, including climate science. This affects the different stages of the data lifecycle, thus posing significant data management challenges in terms of data archiving, access, analysis, visualization, and sharing.

In the context of the European Open Science Cloud (EOSC) initiative launched by the European Commission, the ENES Data Space represents a domain-specific implementation of the data space concept, a digital ecosystem supporting the climate community towards a more sustainable, effective, and FAIR use of data. The service, developed in the context of the EGI-ACE project, aims to provide an open, scalable, cloud-enabled data science environment for climate data analysis on top of the EOSC Compute Platform. It includes both ready-to-use variable-centric CMIP collections from the ESGF federated data archive and compute resources, as well as a rich ecosystem of open source modules and tools, all made available through the user-friendly Jupyter interface. The data space infrastructure has been recently enhanced with a multi-GPU node to provide accelerated computing resources, thus supporting more advanced scientific use cases, such as those based on machine learning.

The service is accessible in the European Open Science Cloud (EOSC) through the EOSC Catalogue and Marketplace (https://marketplace.eosc-portal.eu/services/enes-data-space). It also provides a web portal (https://enesdataspace.vm.fedcloud.eu) including information, tutorials and training materials on how to get started with its main features.

This tutorial will showcase how scientific users can benefit from the ENES data space to perform data analytics and visualization applied to climate and weather domains. More specifically, the training will cover topics from simple analytics tasks to real application examples (e.g., computation of climate indices, machine learning training and inference, etc.) using open source tools, libraries and frameworks from the Python ecosystem.

Presenter: ANTONIO, Fabrizio (CMCC Foundation)

Session Classification: Demonstrations