



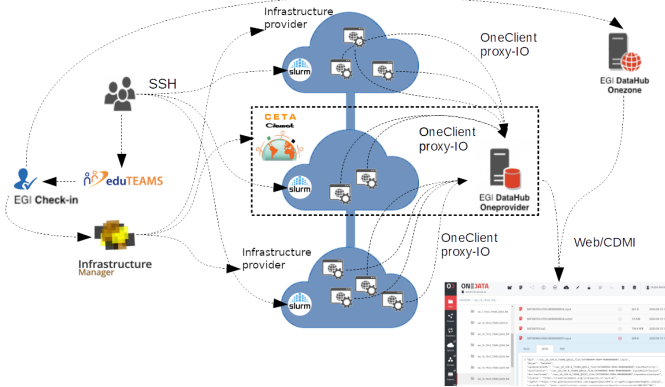
# The EOSC-Synergy cloud services implementation for the Latin American Giant Observatory

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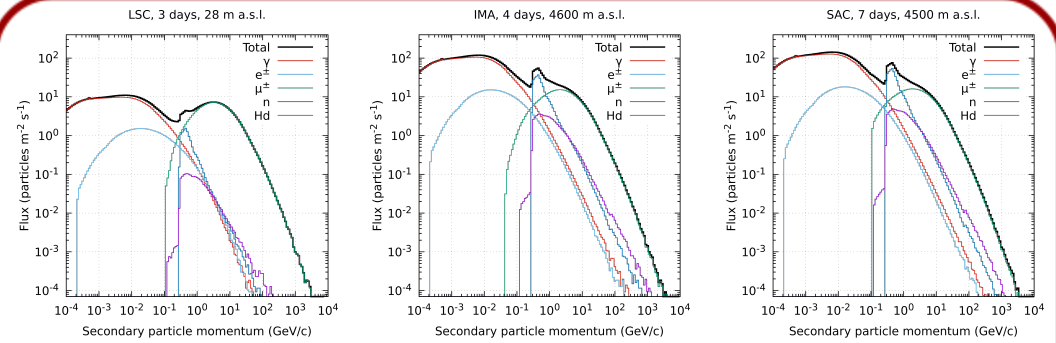
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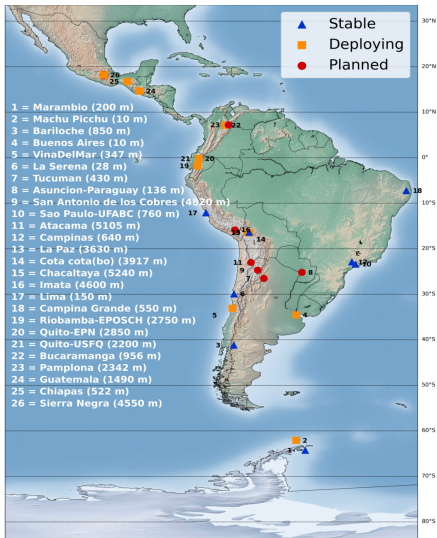
- The development and deployment of a **Docker-based cloud implementation** of the **LAGO-ARTI** framework
- Compatible with any **public** (AWS, Google, Azure...) or **federated cloud (EOSC)** and **local HPC** facilities.
- **Synthetic data and metadata production** with **FAIR** principles



**Cloud-based calculation of the particle flux in the World:** Identity and infrastructure managers, virtualized HPC clusters, Docker images and cloud storage servers.  
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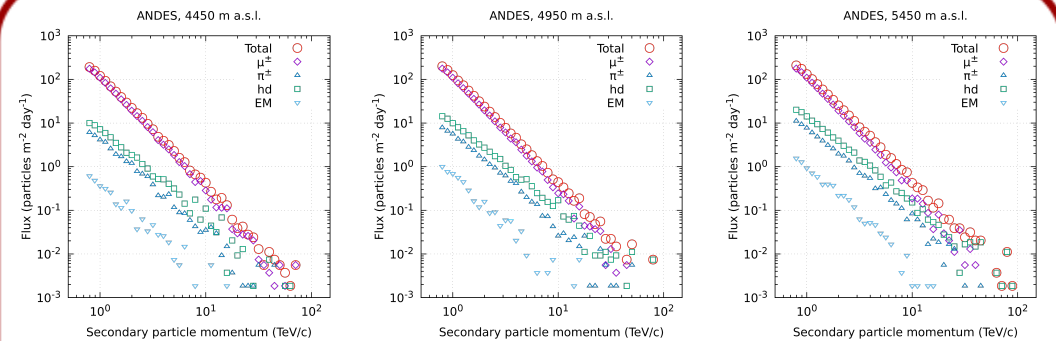


The **expected flux of secondaries** at three different LAGO sites: **La Serena (LSC, Chile, 28 m a.s.l., left)**, **Imata (IMA, Perú, 4600 m a.s.l., centre)** and **San Antonio de los Cobres (SAC, Argentina, 4500 m a.s.l., right)**. Atmospheric absorption is clearly visible in this comparative. These spectra correspond to the **integrated and averaged flux of all secondary particles** at detector level for 3 days at LSC, 4 days at IMA and 7 days at SAC calculated in the new **clour-based framework**.



The **LAGO detection network**

- **LAGO** is an extended **astroparticle observatory** with detectors from **Mexico to Antarctica**
- **Detectors** are mainly 1-10 m<sup>3</sup> **WCD** with a single PMT deployed at different altitudes and geomagnetic coordinates
- **Synthetic data production** is based on **LAGO-ARTI**, our self-designed framework including CORSIKA, MAGCOS, GDAS & GEANT4
- **Synthetic signals** produced by EAS in our detectors are calculated in a precise way **for any detector** of any type, in **any particular site in the World**, and under **realistic** atmospheric and geomagnetic **time-evolving conditions**.



**One-year averaged flux** of the high-energy (HE) secondaries ( $p_s > 800$  GeV/c) expected at three different altitudes of the mountain above the **ANDES underground laboratory**: near the tunnel entrance (4450 m a.s.l.); at mid-altitude (4950 m a.s.l.) and at the summit (5450 m a.s.l.). The HE flux of **charged pions** should be also considered. These studies are of most interest for underground laboratories, and muography applications.