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The Data Handling System of the ASTRI Mini-Array Project

The ASTRI Mini-Array is an international project aimed to build, deploy, and operate an array of nine small-sized dual-mirror Imaging Atmospheric Cherenkov Telescopes (IACTs) at the *Observatorio del Teide* (Tenerife, Spain). The array is designed to perform deep Galactic and extragalactic gamma-ray observations in the 1–200 TeV energy band, in synergy with other ground-based gamma-ray facilities, like MAGIC, HAWC, LHAASO, LST and, in the next future, CTAO.

As part of the overall software system, the ASTRI team is developing and testing a dedicated Data Handling System responsible for the data processing and archiving of all the binary raw data and metadata transferred from the observing site to the off-site ASTRI Data Center located in Rome. Thanks to the high-speed network connection available between Tenerife and Italy and the low data volume produced by the innovative ASTRI Cherenkov cameras, raw data files acquired onsite will be delivered to the ASTRI Data Center immediately after their acquisition. At the Data Center, the Data Processing System will perform in an automated way raw data pre-processing, calibration, reduction, selection, and analysis up to the generation of science-ready data products (event-lists and observation-related IRFs) as well as of preliminary science products, while the ASTRI Mini-Array Archive System will take care to temporary and permanently store, manage and grant access of all relevant data products to the ASTRI community through a dedicated Science-Gateway.

In this contribution we present the main features and components of the ASTRI Mini-Array Data Handling System, and report on the status of its development, implementation, and testing using real data acquired during the commissioning of the first telescope of the array, ASTRI-1, completed in mid-2024 and currently fully operative.

Collaboration(s)

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