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## Measurement and monitoring of the ASTRI Mini-Array pointing accuracy

ASTRI is an international project led by the Italian National Institute for Astrophysics (INAF) aimed at the construction and operation of an array of nine Imaging Atmospheric Cherenkov Telescopes (ASTRI Mini-Array) at the Observatorio del Teide in Tenerife. The primary goal of the project is to study gamma-ray astrophysical sources in the very high-energy domain, particularly at multi-TeV energies. The first telescope of the array, ASTRI-1, is now fully operational, with its commissioning phase initiated in 2024.

The ASTRI camera, mounted at the focal plane, is designed to detect the very fast Cherenkov flashes produced by the incoming cosmic radiation. However, the camera is endowed with a secondary output, the so-called Variance mode, providing low-resolution images of the night sky background. Variance data are adopted for the monitoring of the pointing, using astrometry techniques and the stars in the field of view. However, due to the large pixel size of the Cherenkov camera, only a modest precision is achieved.

To complement the variance technique with higher resolution images, a Pointing Monitoring Camera (PMC) is installed on the back of the secondary mirror of each telescope. The PMC system acquires images of the sky with a machine vision camera in the direction pointed by the telescopes and performs an astrometry check on a dedicated computer hosted in the telescope electronics cabinet. The astrometry results are forwarded to the Telescope Control System to be used as input for the telescope autoguide. This solution ensures a higher precision, but to ensure the accuracy of the pointing of the Cherenkov camera it is crucial to characterize the offset between PMC and Variance data.

This contribution will describe the systems (Variance and PMC) used to monitor and control the pointing of the telescope, together with the relative alignment characterization of these two systems. Moreover, an overview of preliminary performances resulting from the ASTRI-1 commissioning activities in terms of pointing and tracking precision will be shown.

### Collaboration(s)

ASTRI

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