



Performance of the ASTRI Mini-Array at the *Observatorio del Teide*

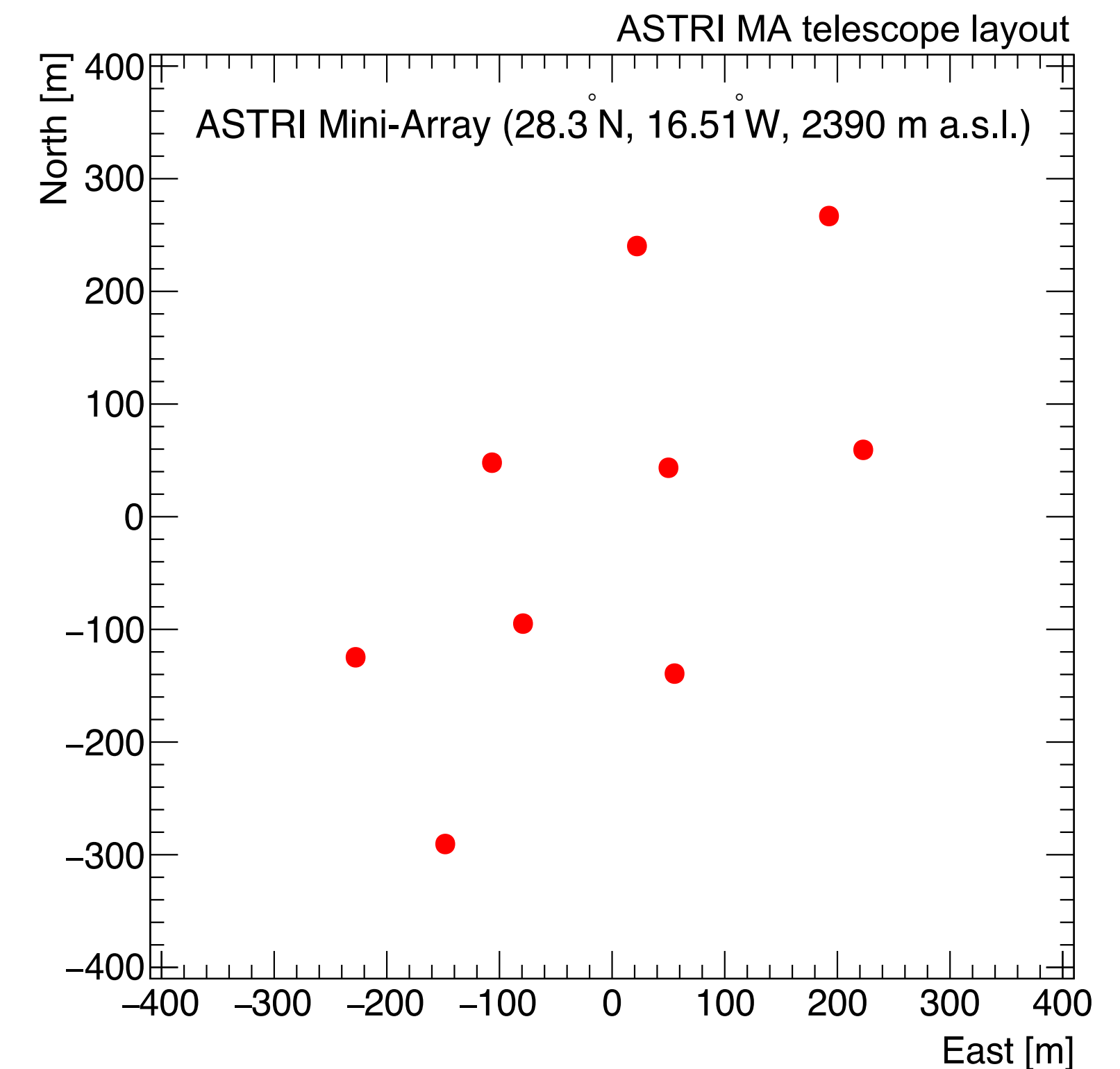
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for the ASTRI Project

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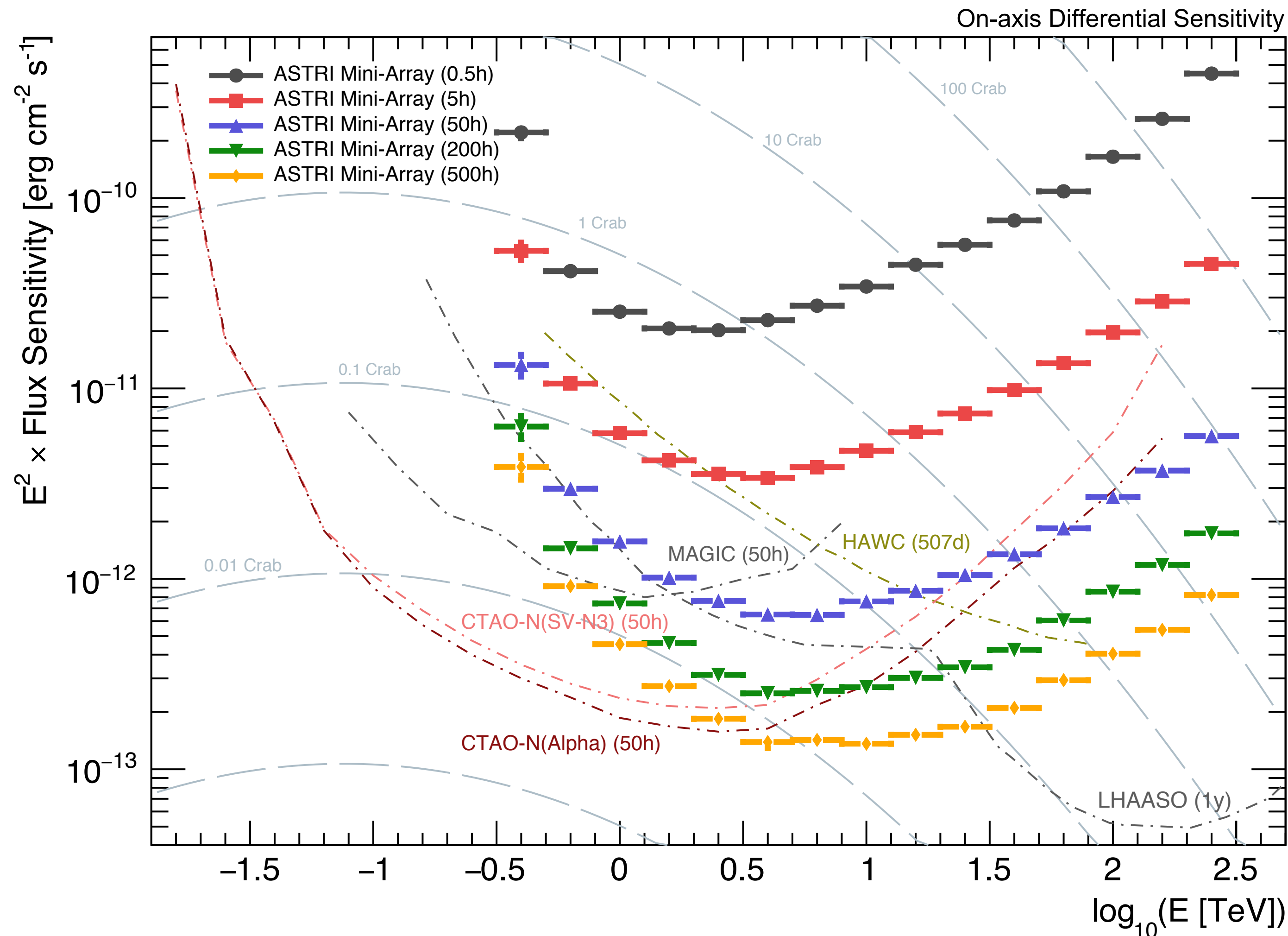


OVERVIEW

- The **ASTRI Mini-Array (ASTRI MA)** is a next-generation ground-based gamma-ray observatory under construction at the *Observatorio del Teide* (Tenerife, Spain). It will be composed of nine small-sized (~ 4 m in diameter) and large-field-of-view ($\sim 10^\circ$) Cherenkov telescopes operating in the energy range from 1 to 100 TeV and beyond. Each telescope is characterized by a dual-mirror optical system and a silicon photo-multiplier camera.
- In order to assess the performance of the ASTRI MA at the Teide Observatory site detailed Monte Carlo simulations were generated (by means of the CORSIKA and `sim_telarray` packages) and subsequently reduced with `A-SciSoft`, the scientific software package of the ASTRI Project.
- Thanks to its performance, the ASTRI MA will allow unprecedented observations of the galactic and extragalactic sky at the TeV and multi-TeV energies, in synergy with present- and next-generation gamma-ray observatories in the Northern Hemisphere.



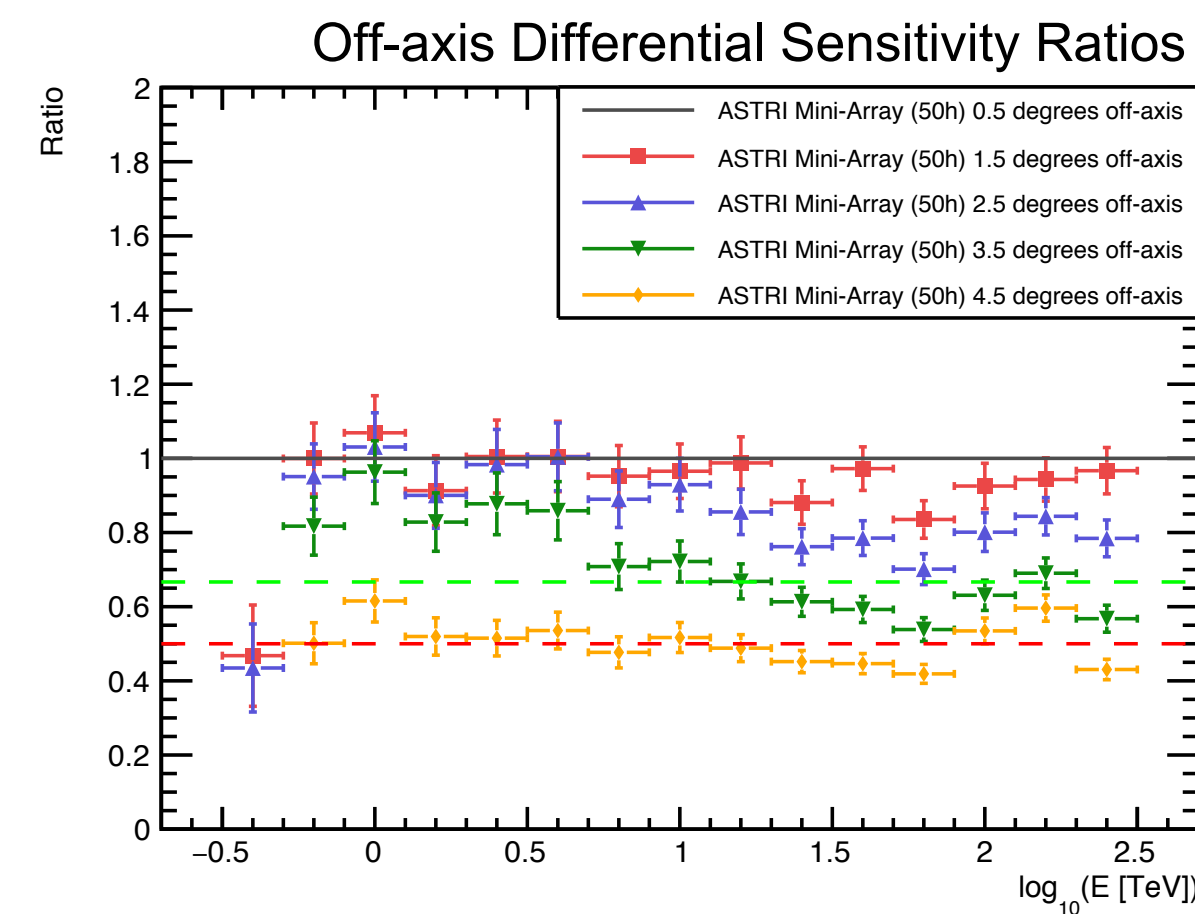
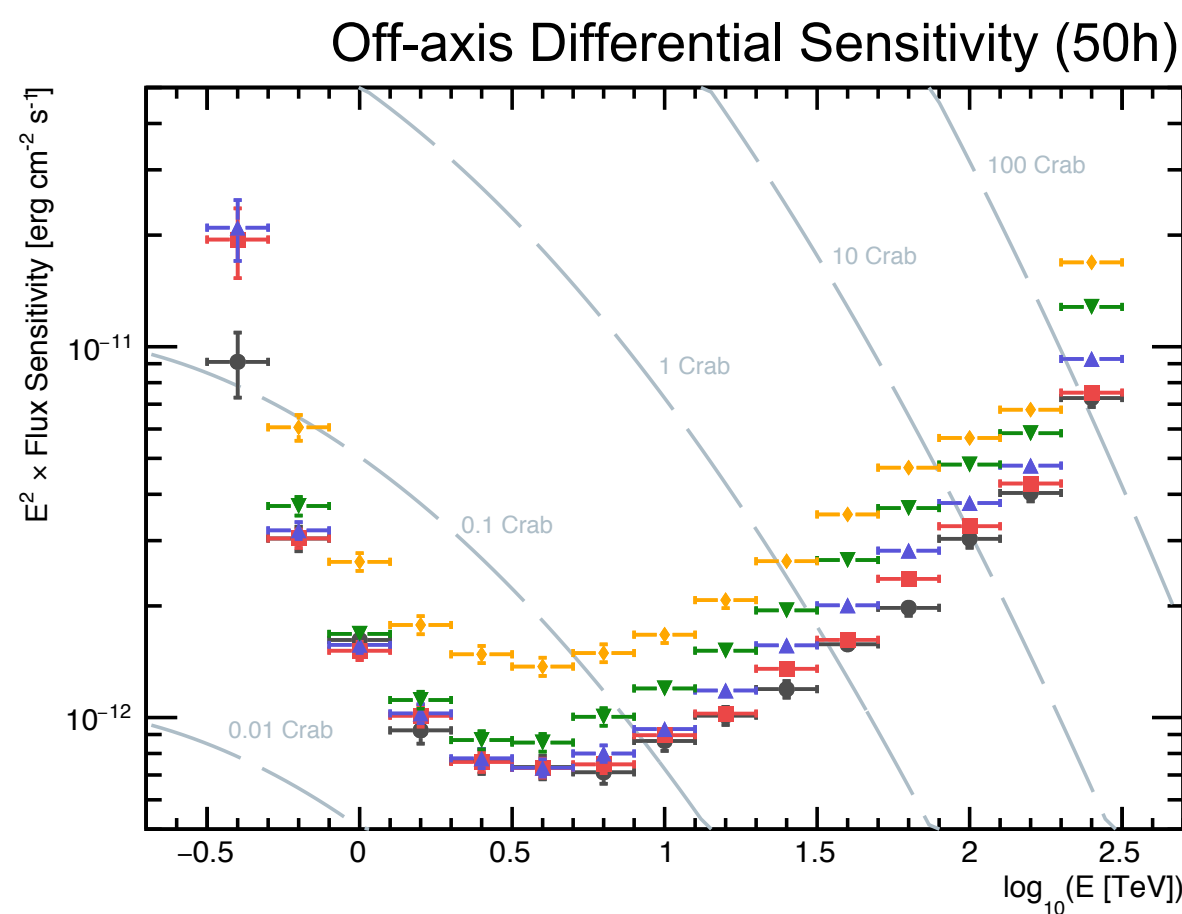
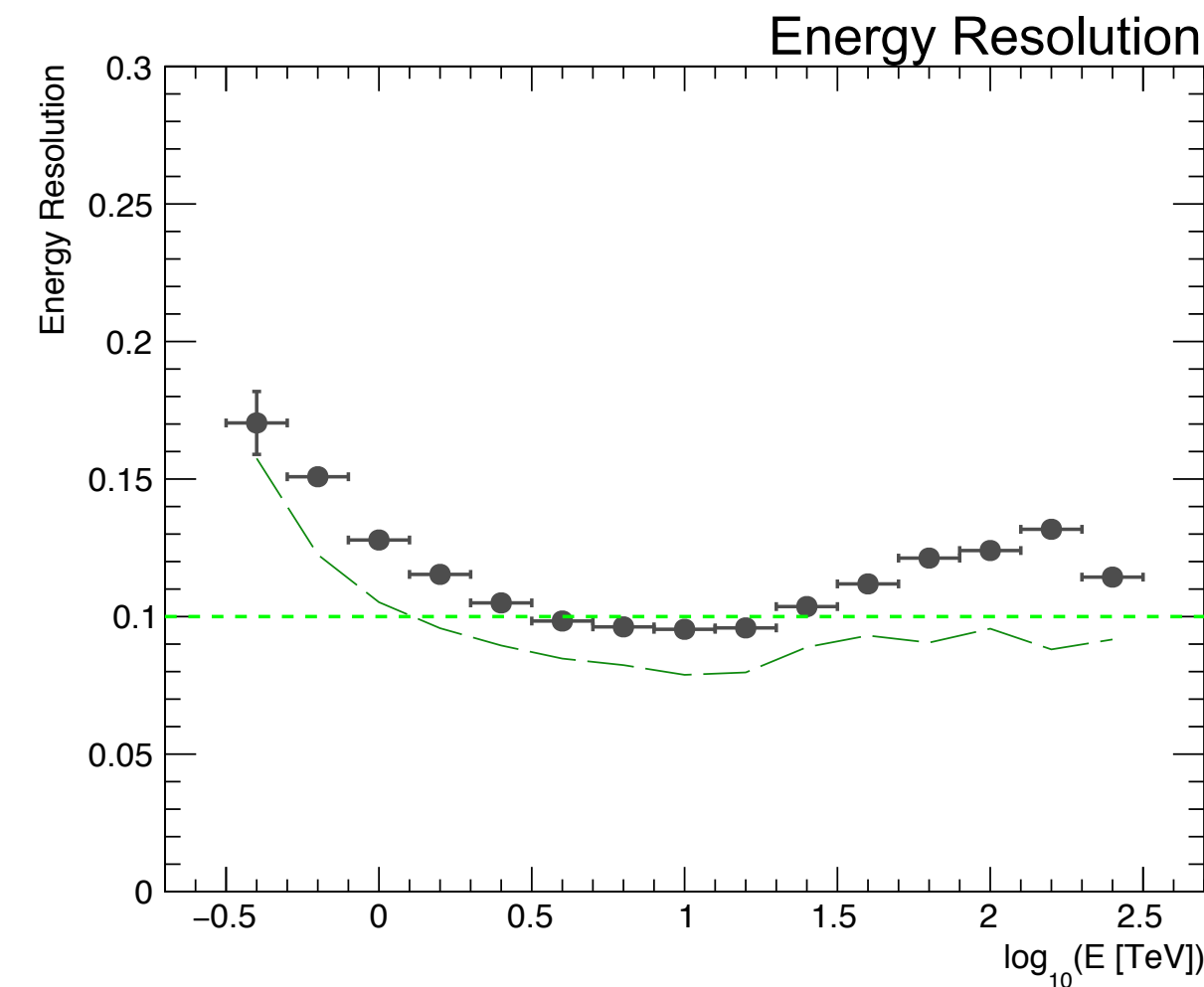
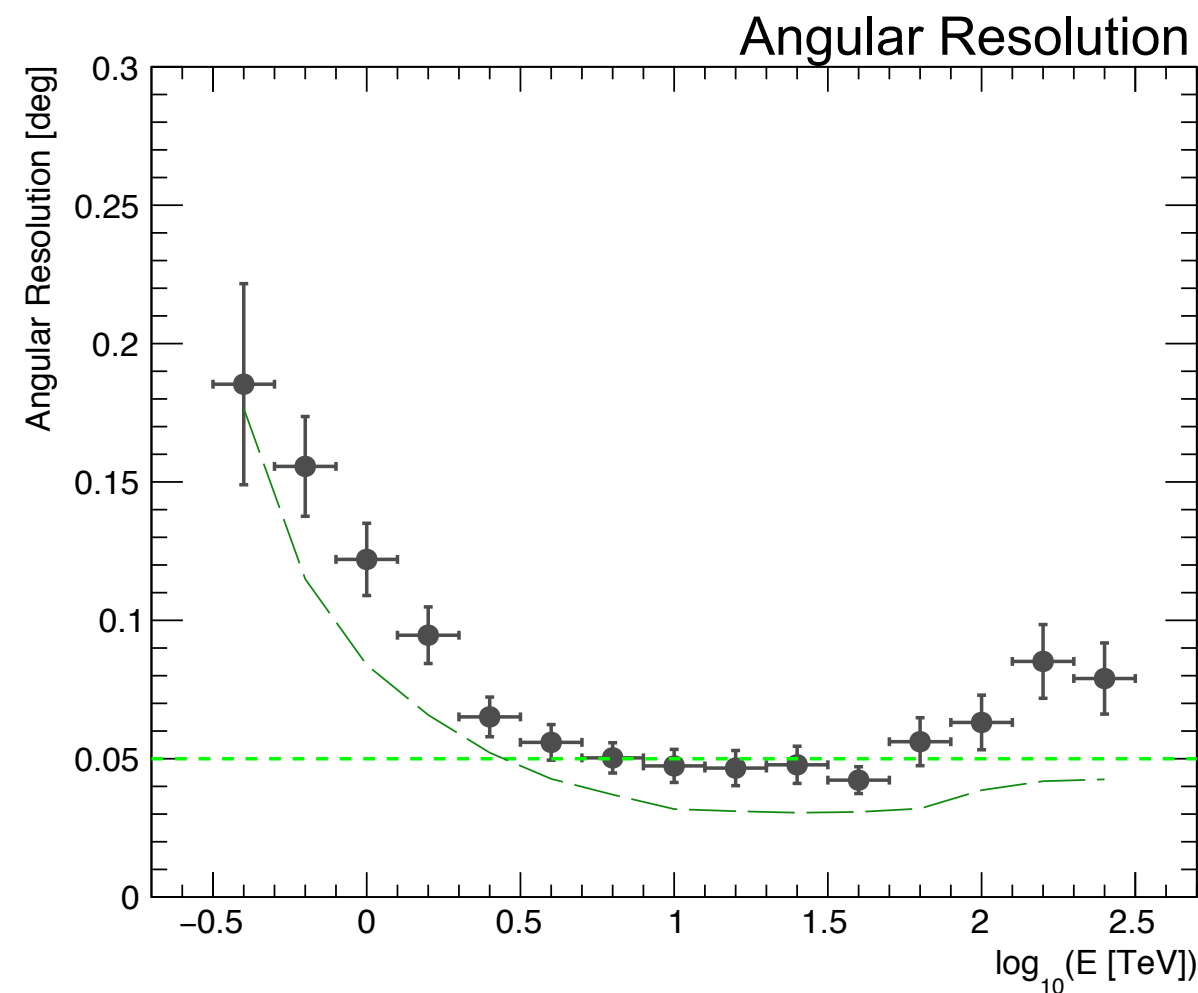
PERFORMANCE



- Differential sensitivity better than present-generation IACTs above a few TeV.
- Differential sensitivity comparable to CTAO Northern Array (in construction phase configuration, dubbed *Alpha*) above a few tens of TeV.
- Differential sensitivity superseded by HAWC (507 days) and LHAASO (1 year) above a few tens of TeV (but at those energies substantially better angular/energy resolution).

➔ ASTRI MA fully functional complement at the TeV energies to present- and next-generation gamma-ray observatories in the Northern Hemisphere.

PERFORMANCE



- Angular resolution of a few arcmin above a few TeV → important for morphological studies of sources detected by HAWC and LHAASO in the multi-TeV regime.
- Energy resolution of ~10% above a few TeV → important for spectral studies at TeV and multi-TeV regime.
- Performance up to $3^\circ(5^\circ)$ from the center of the field of view within a factor of ~1.5(~2) equal to the nominal on-axis performance → important for simultaneous multi-target observations, large surveys of the sky, and possible serendipitous discoveries.