

# The COMET multiperspective event tracker for wide field-of-view gamma-ray astronomy

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The ALTO/COMET R&D project focuses on the development of a new technique for the observation of very high-energy (VHE) gamma-rays from the ground at energies above  $\sim 200$  GeV, thus covering emission from soft-spectrum sources. The ALTO/COMET proposed array under study combines 1241 particle detector units, distributed over a circular area of  $\sim 160$  m in diameter and placed at a very high altitude (5.1 km), with atmospheric Cherenkov light detectors.

The atmospheric Cherenkov light detectors, inspired by the “HiSCORE” design and improved for the energy range of interest, can be operated together with the particle detectors during clear nights. As such, the instrument becomes a Cosmic Multiperspective Event Tracker (COMET). ALTO/COMET is expected to improve the reconstruction of arrival direction, energy and shower maximum determination for gamma-ray-induced showers during darkness, which is crucial for the reduction of background contamination from cosmic rays. Prototypes of both particle and atmospheric Cherenkov light detectors are already installed at the Linnaeus University in Sweden, while we simulate the detector response and estimate the reconstruction improvement for gamma-ray events.

In this contribution, we present Monte-Carlo simulations of the detector array, consisting of CORSIKA shower simulations and custom detector response simulations, together with the coupling of particle and atmospheric Cherenkov light information, the reconstruction strategy of the complete array and the detection performance on point-like VHE gamma-ray sources. In addition, we briefly present the prototype experience.

## Keywords

gamma-rays, wide field-of-view, Cherenkov radiation, very high-energies, atmospheric showers

## Collaboration

other (fill field below)

## other Collaboration

ALTO/COMET

## Subcategory

Future projects

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