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The ASTRI Mini-Array follow-up of transient events in TeV band

The LHAASO detection of the very high energy (VHE) emission component from gamma-ray bursts (GRBs) up to the multi-TeV regime proved the importance of ground-based gamma-ray facilities in exploring the physics of these enigmatic objects up to the extreme energies. In recent years, significant efforts in improving the strategies for follow-up of transient events have been performed within the VHE community, particularly in the current era of multi-messenger triggers. The association of high-energy neutrinos and gravitational waves with transient astrophysical sources will indeed provide insights into the physics of extreme cosmic accelerators. The ASTRI Mini-Array experiment, composed of nine imaging atmospheric dual-mirror Cherenkov telescopes, is currently under construction at the Teide Observatory site and will have the possibility to play an important role in studying the TeV emission in transient events. The ASTRI Mini-Array will be equipped with a dedicated transient handler that will allow us to perform specific follow-up campaigns on a wide range of astrophysical sources like GRBs, galactic transients, and the possible VHE electromagnetic counterpart of neutrinos and gravitational waves. We studied the performance of the ASTRI Mini-Array in detecting the possible TeV signatures from nearby events such as on- and off-axis GRBs. The implementation and optimization of a possible ASTRI Mini-Array observational strategy based on specific science cases will also be discussed.

Collaboration(s)

ASTRI

Authors: CAROSI, Alessandro (INAF - Astronomical Observatory of Rome); BULGARELLI, Andrea (INAF/OAS Bologna, Via P. Gobetti 93/3, I-40129 Bologna, Italy); GIULIANI, Andrea (INAF/IASF Milano); D'AÌ, Antonino (INAF/IASF Palermo); STAMERRA, Antonio (INAF-OAR); TUTONE, Antonio (IASF - INAF); PINTORE, Fabio; LUCARELLI, Fabrizio (INAF-Osservatorio Astronomico di Roma); SATURNI, Francesco Gabriele; GHIRLANDA, Giancarlo (INAF); TOSTI, Gino; Dr NAVA, Lara (INAF); ANTONELLI, Lucio Angelo; SCUDERI, Salvatore; LOMBARDI, Saverio (INAF / ASI-SSDC); VERCELLONE, Stefano

Presenter: CAROSI, Alessandro (INAF - Astronomical Observatory of Rome)

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