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LATTES - a new detector concept to monitor VHE gamma-ray sources

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The era of Multi-Messenger Astrophysics has been officially inaugurated thanks to the detection of a High Energy neutrino event from a gamma-ray flaring Fermi-LAT blazar, together with the combined gamma-ray and gravitational signal from an identified cosmic source. Given the extreme and transient nature of the underlying processes, it has become clear that monitoring the sky in Very High Energy gamma-rays (VHE, $E > 10$ GeV) will provide a fundamental contribution to their interpretation. In this communication, we present a new detector concept, which can increase the performance of Extensive Air Shower (EAS) arrays, improving the sensitivity and resolution achieved so far and bridging the spectral gap that separates space-borne and ground-based observing facilities. This type of observatories will play a fundamental role in surveying the sky with a high duty-cycle and a wide field of view, which are mandatory requirements to detect transients. In addition, the large effective areas that they can cover make them ideal to survey a spectral energy range where satellite observations are very difficult to obtain, due to the intrinsically low fluxes of sources. Here, we discuss the contribution that an observatory based on an innovative hybrid detector will bring to the investigation of VHE emission from blazars with extreme SEDs, characterizing the spectral properties of these sources during flare events and placing constraints on the physics of the jet photon production in the VHE domain. We will describe a new approach to the gamma-ray initiated air shower analysis, in order to improve the suppression of cosmic-ray background, and we will finally summarize how the investigation of extreme gamma-ray emission from blazars will be affected by the ability to monitor the sky at VHE.

Are you presenting on behalf of collaborations or institutions?

Fermi-LAT collaboration

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