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Study of the PeVatron candidate SNR G106.3+2.7 observed at Large Zenith Angle with LST-1 and MAGIC

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The quest for PeVatrons, sources of cosmic rays accelerated up to PeV energies, saw an exciting development in 2021 when LHAASO detected 12 ultra-high energy (UHE) gamma-ray Galactic sources. Among those sources, the supernova remnant G106.3+2.7 (also called the Boomerang SNR) is a promising candidate to both hadronic and leptonic scenarios for the UHE emissions.

Gamma-ray astronomy performed with Imaging Atmospheric Cherenkov Telescopes (IACTs) is the tool of choice when it comes to looking at the most energetic sources of the Universe with the best angular resolution (~ 0.01 deg). We are currently observing the Boomerang SNR with LST-1, the Large Size Telescope prototype of the Cherenkov Telescope Array, together with the two IACTs of the MAGIC experiment. Observations at Large Zenith Angle allow us to explore the 1-50 TeV region of the energy spectrum with an angular resolution sufficient to resolve the source's morphology.

Such observations raise challenges regarding the reconstruction and the analysis of the data, namely the rapid change of energy threshold and signal properties with the telescope pointing. To improve the uniformity of the response as function of the zenith angles we worked on optimizing the Random Forest based reconstruction pipeline and the data selection.

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