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Using muon rings for the optical throughput calibration of the SST-1M prototype for the Cherenkov Telescope Array

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Imaging Atmospheric Cherenkov Telescopes (IACTs) are ground-based instruments devoted to the study of very high energy gamma-rays coming from space. The detection technique consists in observing images created by the Cherenkov light emitted when gamma rays, or more in general cosmic rays, propagate in the atmosphere. While in case of protons or gammas the images present a filled and more or less elongated shape, energetic muons penetrating the atmosphere are visualized as characteristic circular rings or arcs. A relatively simple analysis of the ring images allows the reconstruction of all the relevant parameters of the detected muons, such as the energy, the impact parameter, and the incoming direction, with the final aim to use them to calibrate the total optical throughput of the given IACT telescope. We present the results of preliminary studies on the use of images created by muons as optical throughput calibrators of the single mirror small size telescope prototype SST-1M proposed for the Cherenkov Telescope Array.

Collaboration

CTA

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