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# A novel image correction method for cloud-affected observations with Imaging Atmospheric Cherenkov Telescopes

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The Imaging Atmospheric Cherenkov Telescopes observational technique employs the atmosphere as part of the detector, thus it is sensitive to all the changes taking place in it. Particularly, in the presence of clouds, the detector registers incomplete and degraded information caused by additional light absorption. Such observations are often rejected from further analysis process due to increased systematic errors. Therefore, we developed an innovative correction method on the image parameters based on a simple geometrical model which relates the pixel position on the camera to the expected height of the emitted Cherenkov light registered by that pixel.

We present the results of an investigation of a correction method applied to the Monte Carlo simulations, imitating the very-high-energy events affected by clouds registered by an array of four Large-Sized Telescopes, at the core of the future Cherenkov Telescope Array Observatory. We studied the one- and two-layer clouds located at different heights and assuming various transmission parameters. We show the effect of the correction method, which efficiently corrects the extinction of light in clouds and improves gamma-ray event reconstruction as well as overall system performance. The correction method eliminates a need for the additional time-consuming and computationally intensive Monte Carlo simulations.

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