Monitoring the pointing of the Large Size Telescope prototype using star reconstruction in the Cherenkov camera

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The first Large Size Telescope (LST-1) proposed for the forthcoming Cherenkov Telescope Array (CTA) has recently started to operate in La Palma. The large structure of LST-1 - with a 23 m mirror dish diameter - imposes a strict control of its deformations that could affect the pointing accuracy and its overall performance. According to CTA specifications that are conceived to resolve e.g. the fine structure of galactic sources, the LST post-calibration pointing accuracy should be better than 14 arcseconds. To fulfill this requirement, the telescope pointing precision is monitored with two dedicated CCD cameras located at the dish center. The analysis of their images allows us to disentangle different systematic deformations of the structure.

In this work, we investigate a complementary approach with lower precision but offering the possibility to monitor the pointing of the telescope during the acquisition of Cherenkov data. After properly cleaning the events from the Cherenkov showers, the reconstructed positions of the stars imaged in the camera FoV are compared to their nominal expected positions in catalogues. This provides a direct measurement of the telescope pointing, that can be used to cross-check the other methods and as a real-time monitoring of the optical properties of the telescope and of the pointing corrections applied by the bending models. Additionally, this method benefits from not relying on specific hardware or dedicated observations.

In this contribution we will illustrate this analysis and show results based on sky data of LST-1.

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Gamma rays: instrumentation; Cherenkov telescopes: data quality monitoring; Cherenkov telescopes: pointing

Collaboration

CTA

other Collaboration

LST

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Experimental Methods & Instrumentation

Primary authors: Dr FOFFANO, Luca (University of Geneva); CAROSI, Alessandro (Unige-DPNC); Dr DALCHENKO, Mykhailo (DPNC, University of Geneva); DELLA VOLPE, Domenico (Universite de Geneve); HELLER, Matthieu (University of Geneva); Prof. MONTARULI, Teresa (University of Geneva)

Co-author: FOR THE CTA LST PROJECT

Presenter: Dr FOFFANO, Luca (University of Geneva)

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