ID de la contribución : **187** Tipo : **Talk**

An event-type based analysis for LST-1

jueves, 6 de noviembre de 2025 15:15 (15)

The analysis generally applied to Imaging Atmospheric Cherenkov Telescopes data optimizes quality selection cuts, selecting a sub-sample of high-quality events, and computes a set of Instrument Response Functions (IRFs) for these events. All surviving events are treated as equal in quality, and are assumed to be well represented by a single set of IRFs, while the rest of the events are discarded. A different approach, already proven successful by experiments such as Fermi-LAT, is an event-type based analysis. It consists of separating the events in subsamples according to their expected reconstruction quality and generating IRFs for each subsample. At the science tools level, these subsamples are analysed jointly and treated as independent observations, each with their own set of IRFs.

In this work we explore the use of machine learning techniques to estimate event reconstruction quality. A model predicts the error on the angular reconstruction of each event. Events are ranked according to their expected angular reconstruction quality, and separated into different partitions. Using simulations of the future Cherenkov Telescope Array Observatory (CTAO), this procedure has already been proven to significantly boost both angular resolution and energy resolution. We present an implementation of this methodology for a set of Crab Nebula data acquired by The Large-Sized Telescope prototype (LST-1) with the goal to test the performance of the event-type based analysis.

Primary author(s) : GARCÍA SOTO, Silvia (Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT))

Co-author(s) : BERNETE, Juan (Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT)); HASSAN , Tarek (Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT)); STRZYS, Marcel (Institute for Cosmic Ray Research, The University of Tokyo); VOVK, Ievgen (Institute for Cosmic Ray Research, The University of Tokyo); LINHOFF, Maximilian (CTAO, Science Data Management Centre (SDMC))

Presenter(s) : GARCÍA SOTO, Silvia (Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT))

Clasificación de la sesión : Gamma Rays

Clasificación de temáticas : Gamma rays