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HAP-Fr, a pipeline of data analysis for the HESS-II experiment

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The H.E.S.S. (High Energy Stereoscopic System) experiment is dedicated to the observation of very high energy gamma-rays using the Imaging Atmospheric Cherenkov Technique. Since 2012, the array of 4 telescopes of 12m diameter (CT1-4) is functioning with a fifth telescope, CT5, of 23m diameter. The full array allows now to observe gamma-rays down to few tens of GeV. With this hybrid array of telescopes, several observations modes are possible, in 'stereo' with only the 12m-class telescopes, in 'hybrid' with all telescopes and in 'mono' with only CT5. The pipelines of data analysis have then been evolved to deal with this first hybrid array of Cherenkov telescopes.

Here is presented the HAP-Fr (HESS Analysis Package-France) pipeline allowing to treat the data of these different observation modes whatever the calibration chains and the different Monte-Carlo simulations packages. This analysis chain aims to process raw data in order to reduce them, reconstruct the shower properties with different algorithms for the mono mode (CT5), stereo mode (CT1-4) and hybrid mode (CT1-5), reduce the cosmic-rays background with advanced multivariate analysis and derive high-level products by controlling finely their statistical properties.

In this communication, the main algorithms of HAP-Fr are introduced and the analysis performance are given with the three instrument configurations.

Collaboration

H.E.S.S.

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