

Towards open and reproducible multi-instrument analysis in gamma-ray astronomy

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Analysis and combination of data from different gamma-ray instruments involves the use of collaboration proprietary software and case-by-case methods.

By defining a common open format for high-level gamma-ray data (containing event lists and instrument response functions, using the FITS standard) we allow multi-instrument analysis within the context of open-source software.

This project aims to perform the first fully-reproducible, multi-instrument very-high-energy gamma-ray analysis.

Data of *Fermi*-LAT, MAGIC, VERITAS, H.E.S.S., and FACT, compliant with a preliminary common format (DL3) and analysed with the gammapy science tools, were used to produce a first joint fit of the Crab Nebula spectrum. Aspects of the error evaluation and the release format of a spectral measurement are also included in the discussion.

The talk will illustrate how to realize a fully reproducible publication relying on open access assets as GitHub repositories (<https://github.com/open-gamma-ray-astro/joint-crab>) and will promote and review current open data format and science tools to allow VHE gamma-ray astronomy to move towards open reproducible science.

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