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Gamma-ray trajectory reconstruction using Deep Learning methods

The Dark Matter Particle Explorer experiment allows for γ -ray detection up to TeV energies, with an unprecedented energy resolution of about 1\%, which makes it a unique instrument for γ -ray physics at these energies. A deep-learning tool for track reconstruction has already been developed for electrons and ions. We used this tool on γ -ray samples to assess its efficiency on trajectory reconstruction up to 10 TeV. Preliminary results using a deep-learning model trained on electron samples and applied to γ -ray samples already show very promising results and bring the prospect of this new tool in high energy γ -ray study. The efficiency of the γ selection by the deep-learning method is compared to the classical Kalman-filter-based techniques, and a preliminary source study based on deep-learning is shown.

Collaboration(s)

DAMPE Collaboration

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