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Selection of cosmic-ray electrons and positrons in Fermi-LAT data with Unsupervised Learning techniques

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Measuring the energy spectrum of cosmic electrons+positrons in the energy range 50 GeV - few TeV can provide evidence of the existence of local sources of either an astrophysical or exotic nature (such as dark matter). Several results have been reported in the last years and there are significant differences among some of them, particularly at higher energies where uncertainties are more considerable.
The latest Fermi-LAT measurement was based on an electron+positron selection involving supervised Machine Learning methods, that are model-dependent, being trained on Monte Carlo simulations, and may thus be sensitive to important systematic uncertainties or biases. Here, we present an alternative approach based on Unsupervised Learning techniques, exploiting their potential in detecting patterns without any guidance and enabling a completely model-independent approach.

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