

# Detection of new Misaligned Active Galactic Nuclei in the Fermi-LAT Fourth Source Catalog using machine learning techniques

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Active galactic nuclei (AGN) are the most luminous and abundant objects in the  $\gamma$ -ray sky. AGN with jets misaligned along the line-of-sight (MAGN) appear fainter than the brighter blazars, but are expected more numerous. Fermi Large Area Telescope (LAT) detected 40 MAGNs compared to 1943 blazars. The aim of this study is to identify new MAGN candidates in the blazars of uncertain type (BCUs) listed in the Fermi-LAT 10-years Source Catalog using an artificial neural network (ANN).

The statistical tests applied to the trained ANN reveals that a classification with machine learning techniques is feasible with high accuracy and precision. The trained ANN has been applied to the 1120 BCUs which have been classified into 655 BL Lacs and 314 Flat Spectrum Radio Quasars (FSRQs). Among the re-classified BCUs, the possible MAGN candidates have been determined by applying thresholds on the spectral index and gamma-ray luminosity. Our results led to 36 possible MAGN candidates, which respect the main physical properties of the 40 MAGN already listed in the Fourth Fermi Catalog.

## Keywords

AGN; MAGN; Machine learning;

## Collaboration

## other Collaboration

## Subcategory

Theoretical Results

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