

Search for gamma-ray counterparts of newly discovered radio astrophysical sources

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The aim of the present work is to correlate highly energetic, short lived events in the radio wave spectrum, known as Fast Radio Bursts (FRB), and compact radio sources known as Faranoff-Riley 0 (FR-0) with gamma rays using data from the Fermi satellite. FRB's origin is still unknown, although, given their spatial distribution, an extragalactic origin is suspected. Up to date, only one FRB (FRB121102) has been identified due to its repeating nature.

The identification of a gamma ray counterpart for these events would put them as candidates to most energetic observed event, while providing important clues as to their origin.

The Faranoff-Riley classification divides radio sources in Class I (luminosity decreases with distance to the center), Class II (luminosity increases in the lobes) and Class 0 (similar to Class I but with a large deficit of extended radio emission). The study of FR-0s in other wavelengths is crucial to better understand the source's engine.

In this work, we model gamma ray fluxes of both FRBs and FR-0s to find a significant correlation. This analysis is made by varying the time windows (in the case of FRBs), the various models used (e.g: power law, log parabola, cutoff, etc) and searching for an optimal set of parameters to maximize the test statistics for the excess flux in gamma rays.

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