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

We study two newly discovered classes of radio sources: the highly energetic, short-lived events, known as Fast Radio Bursts (FRBs), and a new category of compact sources known as Fanaroff-Riley type 0 radio galaxies (FR0s). Due to a possible catastrophic event origin for the FRBs and a previous correlation found with an FR0 in the gamma ray spectrum, it is possible that these radio sources could also emit high energy photons in the Fermi-LAT satellite energy range (20 MeV - 300GeV). We present an exhaustive time-dependent and spatial search of all up-to-date observed FRBs and FR0s, respectively. We perform a likelihood analysis of the radio sources by modeling the excess flux of gamma rays with a varying index power law function using data from Fermi-LAT and the 4FGL catalog. Sources with test statistic greater than 16 (corresponding to about 4 sigma) were further analyzed including 2 FRBs and 7 FR0s. No correlations with more than 5 sigma were found after taking into account nearby sources. Therefore, upper limits for all sources were calculated.

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