

On the nature of the galactic population of 3EG sources

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We present the results of a study on the possible association of unidentified gamma-ray sources in the 3EG Catalog with different types of galactic objects such as Wolf-Rayet (WR) and Of stars, supernova remnants (SNRs), and OB star associations (considered as pulsar tracers). We have made simulations of large numbers of galactic populations of gamma-ray sources in order to weight the statistical significance of the positional coincidences. We have found that 6 EGRET detections are coincident with WR stars, 4 with Of stars, 22 with SNRs, and 26 with OB associations. The probability that all the SNR and OB coincidences were the pure effect of chance is negligible ($< 10^{-5}$ and $< 10^{-3}$, respectively). The statistical support for the association of massive stars with EGRET sources is not compelling (probabilities $\sim 10^{-2} - 10^{-1}$). However, we find that there are a posteriori arguments to support at least three candidates for gamma-ray production in star systems with strong stellar winds: WR 140, WR 142, and Cyg OB2 No. 5.