

# Population synthesis of Fermi LAT sources: A Bayesian analysis using posterior predictive distributions

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## Summary

Fermi-LAT has provided an unprecedented view of the gamma-ray sky and in particular has found a host of previously unknown point sources, i.e. the 3FGL. Of the 3033 objects in the 3FGL, 1010 remain unassociated to a particular source class. To create effective follow up surveys of these objects it is essential to make probabilistic statements about the potential class of an individual source. We present a statistically rigorous method of analysing the entire 3FGL data set to provide constraints on spatial distributions, luminosity functions, and spectral shapes whilst also providing “semi heirachical” posteriors for the association of a source to different classes of objects. We do this by combining the power of an unbinned likelihood analysis and generation of the posterior predictive distribution in a Bayesian framework. In this talk I will present our method and discuss its results in the context of the potential population of millisecond pulsars towards the galactic centre.

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