

Search for periodicities in irregularly-sampled AGNs with a time-domain approach

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This project investigates a new methodology to search for periods in light-curves of high-energy gamma-ray sources such as Active Galactic Nuclei (AGNs). High-energy light curves have significant stochastic components, making period detection somewhat challenging.

In our first model, periodic terms, drifts of the light-curves and random walk with correlation between flux points due to colored noise are taken into account independently. The parameters of the model are obtained directly from a Markov Chain Monte-Carlo minimization. Also, this model allows to study the variability in time of period and amplitude of oscillating terms. This has been already applied to a sub-sample of 27 Fermi-LAT sources and has been published in ApJ.

Now, the algorithm has been developed further to be able to analyze light curves with irregular data or with important gaps between points. This opens the possibility to study all the thousands of AGNs available from Fermi-LAT and not only the small sub-sample with continuous data. Here, we aim to present the methods developed and the results on continuous data, as well as the preliminary results on irregular data.

Track

Analysis Techniques

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