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Search for periodicities in High Energy AGNs with a time-domain approach

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 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. The time periods found are compared to the output of the publicly available Agatha program. The search method is applied to high-energy periodic AGN candidates from the Fermi-LAT catalogue. The significance of periodic models over pure noise models is discussed. Finally, the variability of the period and amplitude of oscillating terms is studied on the most significant candidates.

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