

A new approach to search for binary black holes with Fermi/LAT

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Blazars are powered by super-massive black holes in their centers and are known for extreme variability on time scales from minutes to years. In case of a binary black hole system, this duality is traceable as periodic modulation of their gamma-ray emission. So far, high-significance periodicity has been reported for a very few blazars with standard approaches.

We developed a method to search for periodic patterns in Fermi/LAT light curves, using information field theory (IFT). IFT is a formulation of Bayesian statistics in terms of fields. Bayesian statistics is ideal for the problem at hand since the data is incomplete, irregularly sampled and obeys non-Gaussian statistics such that common least-squares methods do not apply. Simulated Fermi/LAT light-curves are used for significance testing and to provide a proof of the used method.

We present first results, analyzing a sample of promising binary black hole candidates like PG 1553+113 and Mrk 501.

Primary author: KRETER, Michael

Presenter: KRETER, Michael

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