Exploring the Variability Properties of gamma-ray Emission from Blazars

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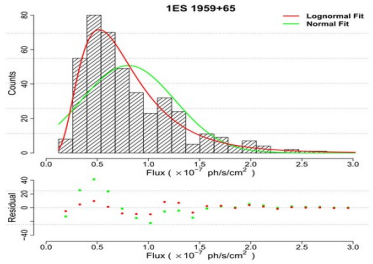
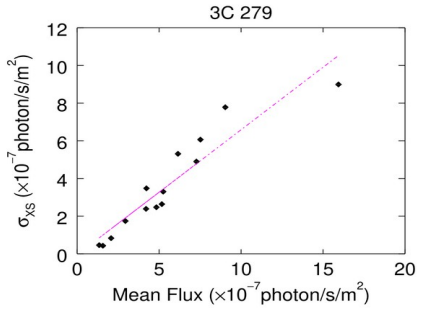
I present results of variability study of a sample of 20 powerful blazars using Fermi/LAT (0.1-300 GeV) observations. We studied decade-long observations applying various analysis tools such as flux distribution, symmetry analysis, and RMS-flux relation.

The main results can be summarized as below:

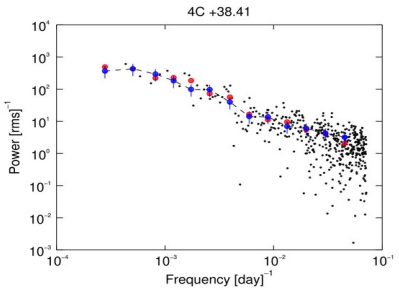
The gamma-ray flux distribution of the sample sources was found to closely resemble a log-normal probability distribution function.



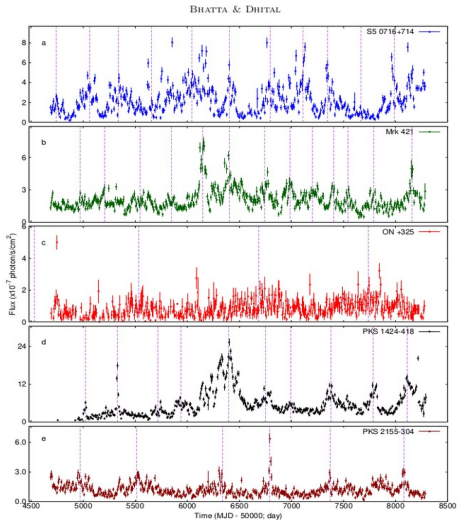
The mean flux and the RMS followed a linear correlation

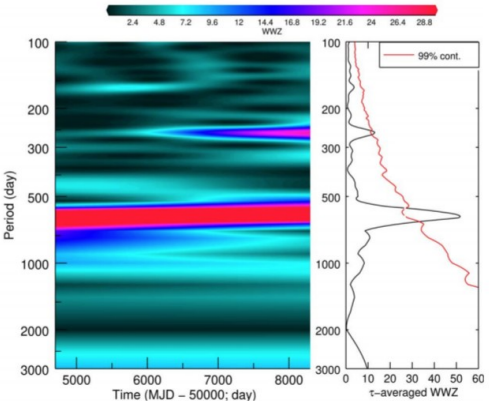


The power spectral density analysis shows the statistical variability properties of the sources as studied are consistent with flicker noise, an indication of long-memory processes at work.



In some of the sources, that is, S5 0716+714, Mrk 421, ON +325, PKS 1424-418, and PKS 2155-304, we detected year-timescale quasi-periodic oscillations





The weighted-average z-transform analysis reveals a ~600 d QPO in the source PKS 2155-304

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