Seminarium Astrofizyczne

wtorek 16.05.2023 godz. 12:30
ul. Pasteura 7; sala 404

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Multi-messenger timing analysis of radio-loud active galactic nuclei

Radio-loud galaxies, which are a sub-class of active galactic nuclei, are powered by supermassive black hole at the center. The objects feature kpc-Mpc scale relativistic jets that are believed to be dominated by Poynting flux and constitute one of the most efficient cosmic particle accelerators, that are capable of accelerating the particles up to EeV energies. In the case of blazars, where the jet is closely aligned to the line of sight, relativistic beaming produces dramatic effects such as release of large output of highly variable broadband, radio to TeV, emission. In this presentation, I discuss the results of some of the multi-wavelength temporal studies of blazars. The studies shows that blazars exhibit rapid variability on wide range of spatial and temporal frequencies. The observed variability is characterized by long-memory power-law power spectral density, log-normal flux distribution, strong correlation between optical and gamma-ray emission, and, in some cases, quasi-periodic oscillations. In addition, the studies using observations from Pierre Auger observation indicate that the jets of radio-loud galaxies could be potential sources of ultra-high energy cosmic rays. The results can be explained in the light of AGN shock-in-jets models, in which the high energy emission from the sources are associated with the strong shocks propagating along the turbulent jets and/or magnetic re-connection events in the highly magnetized jets.

Serdecznie zapraszam,

Agnieszka Majczyna