Contribution ID: **47** Type: **Oral**

High Energy Astrophysics with Novel Observables

Thursday, December 8, 2016 12:05 PM (20 minutes)

Despite intensive research over a few decades facilitated by highly sensitive multiwavelength (MWL) telescopes, fundamental characteristics of active galactic nuclei (AGNs) are still open. With respect to physics of individual AGNs, the location and mechanisms of particle acceleration, their connection to flaring, relative importance of hadronic and leptonic processes in specific sources and in general, and finally the fundamental features of variability are up for debate. As a population too, the frequency of flaring in AGNs at different wavelengths and characteristic patterns that are source independent is a subject of ongoing research. In this situation, quantifying characteristics such as variability in terms of novel statistical observables as the power spectral density and the flux probability distribution provides complementary constraints to the traditional energy spectrum, morphology and MWL lightcurve. In this presentation, I demonstrate the potential of using such statistical observables based on time-series methods simultaneously at different wavelengths as a means of both probing fundamental processes in individual AGNs as well as transient studies on their population. Limitations due to observational cadence are explored. Extending from individual MWL observations to population studies at specific wavelengths, prospects of transient and variability pattern detection are evaluated. Finally, mechanisms of particle acceleration and radiative processes leading to observed PSD and PDF are discussed.

Author: Dr CHAKRABORTY, Nachiketa (Max Planck Institute for Nuclear Physics)

Presenter: Dr CHAKRABORTY, Nachiketa (Max Planck Institute for Nuclear Physics)

Session Classification: Variability Methods

Track Classification: HAP Workshop