



Contribution ID: 10

Type: **Oral**

Detecting transient and periodic phenomena in astrophysical sources

Thursday, December 8, 2016 9:50 AM (20 minutes)

Time domain astronomy and astrophysics are concerned with studying the temporal characteristics of the light from distant astrophysical sources that our instruments detect. Consequently, time domain studies are aimed at the detection and characterisation of variability: periodic variability, aperiodic or stochastic variability, and transient events. In this presentation, I propose to introduce and discuss the fundamental elements of statistical data analysis involved in searching for transient phenomena and weak periods in noisy or sparse data. The concepts and techniques I will present apply equally to binned and unbinned time series data. However, given that the primary focus in this workshop is on high energies, special emphasis will be placed on the treatment of event data.

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Session Classification: Variability Methods

Track Classification: HAP Workshop