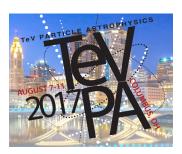Contribution ID: **306**   Type: **Oral**

F-GAMMA program: high-cadence, multi-wavelength radio monitoring as a probe of the physical conditions and variability processes in AGN jets

Thursday, 10 August 2017 16:30 (15 minutes)

The jets of active galactic nuclei (AGN) are among the most powerful systems in the Universe. Their emission spans over an extremely wide energy range, from radio to gamma-rays or even TeV energies, and often shows pronounced variability with timescales anywhere between a few years and several minutes. Therefore, high-cadence, multi-band monitoring programs are essential in the investigation of their physical conditions and variability processes.

The F-GAMMA (Fermi-GST AGN Multi-frequency Monitoring Alliance) was a program for the monitoring of the broad-band radio emission of about 90 Fermi-GST AGN, 25 of which have been detected also at TeV energies. The sources were observed from 2007 to 2015 at 12 radio frequencies between 2.6 GHz and 345 GHz with a mean cadence of 1-1.3 months. Both flux-density and (linear and circular) polarization variability was monitored.

Here we present a compilation of science highlights from the F-GAMMA program, which include various multi-band correlation and population studies (e.g. gamma-ray loudness versus radio variability, radio versus gamma-ray fluxes, variability of FSRQs and BL Lacs), the localization of the gamma-ray emission site in AGN jets, the calculation of their Doppler factors using their multi-wavelength variability as well as a unification scheme for their broad-band spectral variability patterns which show an extremely diverse behavior.

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Session Classification: Extragalactic sources

Track Classification: Extragalactic sources (incl. transients)