8th Heidelberg International Symposium on High-Energy Gamma-Ray Astronomy

Contribution ID: **92** Contribution code: **EGAL** Type: **Oral**

# Towards a TeV blazar sequence and its physical interpretation

*Monday 2 September 2024 15:45 (15 minutes)*

Blazars are a highly energetic subclass of jetted active galactic nuclei, which show a broad band spectral energy distribution (SED) composed of two bumps. They are interpreted as the result of non-thermal emission from the relativistic particles forming the jet.

In 1998, a phenomenological population study –which was later confirmed in 2017 –showed an anticorrelation between the SED integral luminosity and the frequency of the peaks, called the blazar sequence. Despite the large amount of multi-wavelength data collected in recent years, the origin of this observational trend is still unclear with some authors claiming that it could be the result of selection effects.

In this work, we aim at giving a physical interpretation to the blazar sequence, by modeling the sources emission under a unique theoretical framework, in order to have a direct comparison of the results. To do this, we concentrated only on TeV-detected blazars of the BL Lac class.

Differently from the original sequence, we divided the sources into bins based on the frequency of the synchrotron peak, rather than the radio or gamma-ray luminosity. For each bin, we model the SED of one representative candidate with a Synchrotron Self Compton model and investigate different combinations of the physical parameters involved in the emission. For each source, we selected SED data corresponding to an average state of activity to ensure the consistency of the model.

The different scenarios investigated for each bin are discussed and compared, allowing for a comparison of physical properties of BL Lacs belonging to different classes. This will allow us to search for trends hinting at the physical mechanisms underlying the sequence, as well as provide a reference for modeling gamma-ray BL Lacs on a large scale.

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**Session Classification:** Parallel 2