Contribution ID: **62** Contribution code: **EGAL** Type: **Poster**

Searching for Axion-like particles: insights from blazar observations with the LST1 telescope

Monday 2 September 2024 09:32 (1 minute)

Axion-like particles (ALPs) are pseudo-Nambu-Goldstone bosons predicted as an extension of the Standard Model of elementary particles, also considered as viable candidates for Dark Matter. When propagating through astronomical environments embedded with magnetic fields, very-high-energy (VHE) gamma rays may undergo conversion into ALPs, thereby altering the spectral energy distribution (SED) of the observed target, and causing energy dependent oscillations in the photon flux. For ALP masses in the neV range and magnetic field strengths of O(μG), these oscillations occur in the GeV energy range, making the Large-Size Telescope (LST) an optimal instrument for testing the ALPs hypothesis in the VHE gamma-ray range. In our study, we use LST1 data of blazars, including Mrk421, Mrk501, and BL Lac. Through the exploration of their observed spectra, we establish constraints on ALP models within the accessible part of the parameter space. This study and its results provide a unique opportunity to study the combined constraints on the ALPs parameter space using different sources observed with the LST1, along with the challenges and advantages that such approach offers.

Primary authors: D'AMICO, Giacomo (University of Bergen); Dr BATKOVIC, Ivana (University of Padova); DORO, Michele (University of Padova)

Presenter: Dr BATKOVIC, Ivana (University of Padova)

Session Classification: Poster hang