

## **Search for Axion-Like Particles with Observations of the Blazar Markarian 421 with VERITAS**

Axion-like particles (ALPs) are light, pseudoscalar particles that are a beyond-the-standard-model generalization of the axion. Consequently, they are expected to couple to photons in external magnetic fields to compensate for spin difference. This coupling would induce modifications to the gamma-ray spectra of astrophysical sources, such as blazars, via ALP-photon oscillations in external fields near the source and in the Galactic magnetic field. In this contribution, we explore ALP-photon oscillation effects in the spectrum of the blazar Markarian 421. This work was performed using data recorded over more than a decade with the VERITAS gamma-ray observatory, with a particular focus on exceptional flare-state data. Using these observations, we investigate constraints on the two parameters defining the ALP, namely its mass and coupling constant.

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