

Modulations in Spectra of Galactic Gamma-ray sources as a result of Photon-ALPs mixing.

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Axion like particles (ALPs) are fundamental pseudo particles with properties similar to Axions that have been involved to solve the strong CP problem in Quantum Chromodynamics. ALPs can oscillate into photons and vice versa in the presence of an external magnetic field. This oscillation of Photon and ALPs could have important implications for astronomical observations, i.e. a characteristic energy dependent attenuation in Gamma ray spectra for astrophysical sources. Here we have revisited the opportunity to search Photon-ALPs coupling in the disappearance channel. We use eight years of Fermi Pass 8 data of a selection of promising galactic Gamma-ray source candidates and study the modulation in the spectra in accordance with Photon-ALPs mixing and estimate best fit values of the parameters i.e. Photon-ALPs coupling constant ($g_{\alpha\gamma}$) and ALPs mass (m_α). For the magnetic field we use large scale galactic magnetic field models based on Faraday rotation measurements and we have also studied the survival probability of photons in the Galactic plane.

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