Contribution ID: **44** Type: **not specified**

Search for axion-like particle signatures in the gamma-ray spectrum of NGC 1275

Friday 26 June 2015 12:10 (25 minutes)

Axion-like particles (ALPs) occur in a variety of extensions of the Standard Model and are a viable candidate for a constituent of dark matter. ALPs are predicted to couple to photons in external magnetic fields and thus could leave an imprint on gamma-ray spectra. Around the critical energy for photon-ALP conversions, oscillatory features together with a decrease of the photon flux are expected. Especially sources located in galaxy clusters are well suited for searches of these spectral features as galaxy clusters are known to harbor magnetic fields over large spatial extensions. One particular example is the radio galaxy NGC1275 at the center of the Perseus cluster: the value of the central cluster magnetic field is high (of the order of 10μG) and the source is bright in the energy range covered with the Large Area Telescope (LAT) on board the Fermi satellite.

Here, we present the expected sensitivity of the Fermi LAT to the detection of the spectral features. The analysis makes use of the latest instrumental response functions and a detailed modelling of the turbulent cluster magnetic field. For ALP masses between 1 and 10 neV, the Fermi-LAT measurements are expected to be more sensitive than future laboratory searches and might be able to probe optimistic models of ALP dark matter.

Primary author: MEYER, Manuel (Stockholm University)

Presenter: MEYER, Manuel (Stockholm University)