Contribution ID: **53** Type: **Poster**

Axion-like Particles from Core-collapse Supernovae: Investigating Fermi's Sensitivity

Wednesday 25 March 2020 19:01 (1 minute)

Axion-like particles (ALPs) are a well-motivated candidate for constituting a significant fraction of cold dark matter in the Universe. They are hypothesized to be produced in high-energy environments, such as core-collapse supernovae (CCSNe), and could undergo conversion into gamma-rays in the presence of an external magnetic field, spectrally peaking at ˜60 MeV. CCSNe are often invoked as progenitors of long gamma-ray bursts (LGRBs), allowing us to conduct a search for potential ALP spectral signatures using GRB observations with *Fermi* Large Area Telescope (LAT). In this project, we conduct a data-driven sensitivity analysis to find the distance limit for a hypothetical ALP detection with LAT. Furthermore, we select a sample of twenty-four unassociated LGRBs and carry out a model comparison analysis, in which we consider different GRB spectral models with and without an ALP spectral component. We find that the addition of an ALP component does not result in a statistically significant improvement. In this presentation, we will summarize the statistical methods used in our analysis and the underlying physical assumptions, the feasibility of the upper limits on ALP coupling from our model comparison results, and an outlook on future MeV instruments.

Author: CRNOGORCEVIC, Milena (University of Maryland College Park, NASA/GSFC)

Co-authors: CAPUTO, Regina (GSFC/UMCP); MEYER, Manuel (Stanford University)

Presenter: CRNOGORCEVIC, Milena (University of Maryland College Park, NASA/GSFC)

Session Classification: RECEPTION and POSTER SESSION IN THE SAME ROOM

Track Classification: Axions, Alps, Wisps as dark matter