

Search for dark matter lines in the energy spectra of Galactic gamma rays with 13.75 years of Fermi-LAT data

Wednesday, 4 October 2023 16:00 (15 minutes)

Although there is indirect experimental evidence on the existence of dark matter, the debate on its nature is still open. One class of possible candidates is represented by Weakly Interacting Massive Particles (WIMP).

Our galaxy is largely composed of Dark Matter. Assuming that pairs of WIMPs can annihilate to produce gamma rays, or that WIMPs can directly decay into photons, monochromatic lines in the galactic gamma-ray spectrum should be observed. To search for these lines, we analyzed the spectra of gamma rays from our galaxy, constructed using a sample of data collected by the Fermi Large Area Telescope (LAT) in the energy range 1 GeV - 1 TeV in the first 13.5 years of collecting data. The search was carried out in 5 regions of the sky, optimized for different dark matter profiles. We report no evidence of significant signals. Therefore, upper bounds on the annihilation cross section and decay rate of the WIMPs were obtained.

Primary authors: SERINI, Davide (Istituto Nazionale di Fisica Nucleare); LOPARCO, Francesco (Istituto Nazionale di Fisica Nucleare); GILIBERTI, Mario (Istituto Nazionale di Fisica Nucleare); MAZZIOTTA, Mario Nicola (Istituto Nazionale di Fisica Nucleare)

Presenter: GILIBERTI, Mario (Istituto Nazionale di Fisica Nucleare)

Session Classification: Probing the science of AGNs with multimessenger observations