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Study of the Galactic Center region and searches for dark matter with the Fermi Gamma-ray Space Telescope

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Indirect observations from typical rotation curves of spiral galaxies, gravitational lenses, the bullet cluster, baryon acoustic oscillations, among others, provide evidence for the existence of Dark Matter (DM) in the Universe. This DM is thought to be composed of a novel elementary particle that is neutral, stable, and non-baryonic in nature. The Weakly Interacting Massive Particle (WIMP) model proposes a candidate for the DM particle with masses ranging from GeV to TeV, and that, in high density environments of the Universe, could self-annihilate and produce, among other Standard Model particles, gamma rays. (1) The Galactic Center (GC) is an important source of gamma rays, with some known and cataloged objects that can produce such high energy emission. However, recent observations by the Fermi Large Area Telescope (Fermi-LAT) aboard the Fermi Gamma Ray Space Telescope, have indicated a level of gamma-ray radiation above the predicted models, known as the "Galactic Center GeV Excess", for which none of the cataloged sources can account for it. The chosen method to analyze its possible origin will be through the subtraction of the most updated background models, in order to recover the famous "Galactic Center GeV Excess" residual emission and interpret it in terms of a DM self-annihilation signal. (2). The objective of this work is to understand if the detected "excessive" radiation originates from an astrophysical object unknown until now or if it is due to the presence of DM in the GC, based on the data collected by Fermi-LAT. (3).

Palavras-chave: Dark matter. Gamma ray. Galactic Center.

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Referências:

- 1 MCDONALD, J. Simultaneous generation of WIMP miracle-like densities of baryons and dark matter. **Physical Review D**, v.84, n.10, p.103514-1-103514-9, Nov. 2011.
- 2 DAYLAN, T. The characterization of the gamma-ray signal from the central Milky Way: a case for annihilating dark matter. **Physics of the Dark Universe**, v.12, p.1-23, 2016.
- 3 SU, M.; SLATYER, T. R.; FINKBEINER, D.P. Giant gamma-ray Bubbles from Fermi-LAT: active Galactic nucleus activity or bipolar Galactic wind? **Astrophysical Journal**, v.724, n.2, p.1044-1082, Dec. 2010.