



Contribution ID: 308

Type: Poster

Inverse Compton Template Modeling of Geminga and Monogem with the HAWC Gamma-ray Observatory

Friday, December 15, 2023 3:44 PM (1 minute)

TeV gamma-ray halos are a new subclass of gamma-ray sources that could explain the positron excess measured by PAMELA, Fermi-LAT, and AMS-02. Geminga and Monogem are the first two gamma-ray halo candidates reported by the HAWC collaboration. The diffusion coefficient derived by the HAWC Collaboration, $(4.5 \pm 1.2) \times 10^{27} \text{ cm}^2/\text{s}$, differs more than 100 times from the average galactic value. We conducted a follow-up study using data from 2398 days of the HAWC gamma-ray observatory to model the diffuse emission of Geminga and Monogem using 3D template models of electron/positron inverse Compton gamma-ray emission. We used templates for diffusion coefficients between $10^{25} - 10^{27} \text{ cm}^2/\text{s}$ and injection electron spectral indices between 0.0 - 2.2. We present preliminary diffusion coefficient values of $1.07 \times 10^{26} \text{ cm}^2$ and $1.47 \times 10^{26} \text{ cm}^2/\text{s}$ for Geminga and Monogem. Furthermore, we estimate an electron/positron emission efficiency for Geminga and Monogem of 6.6% and 5.1%, respectively.

Primary authors: ZHOU, Hao (Tsung-Dao Lee Institute, Shanghai Jiao Tong University); TORRES-ESCOBEDO, Ramiro (Shanghai Jiao Tong University)

Presenter: TORRES-ESCOBEDO, Ramiro (Shanghai Jiao Tong University)

Session Classification: Poster