Contribution ID: **353** Type: **Poster**

On the uncertainties in the galactic gamma-ray diffuse emission from the determination of the diffusion coefficient

Galactic cosmic rays (CR) undergo diffusion by plasma-wave interactions, nuclear reactions with interstellar gas and other processes during their propagation. A good understanding of the diffusion process is crucial for the interpretation of gamma-ray emissions from electron losses (leptonic emissions) as well as hadronic emissions. Current measurements of CR fluxes have reached unprecedented accuracy thanks to the new generation experiments. Nevertheless, since the determination of the diffusion coefficient relies on the reproduction of secondary-to-primary flux ratios (typically B/C), the diffusion parameters strongly depend on the cross sections employed to compute the production of secondary cosmic rays, whose uncertainties range from 20 to 50% in the best-known reaction channels.
This work is aimed at analysing, via a Markov Chain Monte Carlo algorithm, the AMS-02 data to obtain posterior probabilities of the relevant diffusion parameters in the propagation of CRs in the Galaxy, using the DRAGON code for the evaluation of their propagation. We employ newly calculated spallation and inelastic cross sections from the FLUKA toolkit. Then, we compare two diffusion models: one with diffusion coefficient obtained from the B/C flux ratio and another one with a diffusion coefficient found from a combined analysis of the B, Be and Li, including a renormalization factor of the cross sections used. The leptons spectra are studied adding an extra component due to nearby unknown sources (likely pulsars) to explain their features at high energy. Finally, gamma-ray sky maps and local emissivity spectra are evaluated with these different models and their predictions are deeply discussed.

Primary author: DE LA TORRE LUQUE, Pedro

Presenter: DE LA TORRE LUQUE, Pedro

Session Classification: Dark Matter/CR/Catalogs-2

Track Classification: Diffuse