



Contribution ID: 159

Type: **Presentation**

PAMELA and AMS-02 electron and positron spectra: what do they imply ?

Tuesday, June 24, 2014 4:45 PM (15 minutes)

We use the three-dimensional upgrade of the DRAGON code to model the electron and positron spectra measured by PAMELA and AMS-02.

Presently this is the only cosmic ray (CR) propagation package which allows to account for a realistic spiral arm distribution of CR source in the Galaxy. We find that, once the propagation models are tuned to reproduce the B/C and proton data the lepton data provide valuable new informations about CR propagation properties and on the nature of the $e^- + e^+$ extra component responsible for the positron excess.

The most relevant implications are:

- 1) the extra component is likely to be generated in the Galactic arms. In that case its source spectrum must be peaked at about 10 TeV;
- 2) its energetic is compatible with SNR or pulsar origin;
- 3) if a charge symmetric extra component is adopted, the observed electron spectrum hints to the presence of one or more e^- nearby sources;
- 4) strong reacceleration propagation models are severely disfavored.

We will discuss the impact of those result on the pulsar and the secondary SNR acceleration scenarios for the extra component origin.

We also compare the predictions of some popular dark-matter models which have been proposed to reproduce the positron fraction measured by PAMELA and AMS-02 with the newly measured absolute lepton spectra.

(partially based on arXiv:1311.5575 accepted for publication in PRD).

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Session Classification: Cosmic Rays

Track Classification: Cosmic Rays