Contribution ID: **69**   Type: **Oral Contributions**

Innovative features in modeling CR transport with DRAGON2: hadrons and diffuse gamma rays

Thursday, September 15, 2016 5:15 PM (15 minutes)

We present DRAGON2, the new version of the well-known numerical package designed to simulate all processes related to cosmic-ray (CR) transport: diffusion (treated in a general, position-dependent way), reacceleration, advection, energy losses, nuclear processes.

This talk is focused on the propagation of hadrons, both from steady-state and transient sources in the Galaxy, discussing in detail the technical solutions, the new features and the difference with other codes in the literature.
We focus in particular on the energy losses, and on some aspects of diffusion, showing the implications of position-dependent diffusion coefficient on the interpretation of several long-standing anomalies in the gamma-ray data, and several relevant predictions for neutrino searches.

We also briefly cover the recently developed set of independent cross sections computed with FLUKA and the impact of this new ingredient on the determination of best-fit transport parameters.

Finally, we discuss the relevance of DRAGON2 for dark-matter related searches, with particular focus on the antiproton channel.

Summary

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Session Classification: Cosmic rays

Track Classification: Cosmic rays