

Antiproton production from cosmic-ray interactions and its compatibility with AMS-02 data

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What is this contribution about?

We evaluate the production of antiprotons from cosmic-ray spallation reactions in the context of a model that also matches the rest of secondary cosmic rays and their ratios.

Why is it relevant / interesting?

Recent cosmic-ray studies have claimed the possibility of an excess of antiproton data over the predicted flux at ~ 10 GeV, which can be the signature of dark matter. Nevertheless, this excess is subject to many uncertainties related to the evaluation of the antiproton spectrum produced from spallation interactions of CRs that we have considered in this analysis.

What have we done?

We evaluate the antiproton spectrum from a diffusion model obtained from a combined Markov-Chain Monte Carlo analysis where we combine B, Be, Li and antiprotons, including nuisance parameters to rescale the cross sections of production of secondary cosmic rays.

What is the result?

We find that the experimental antiproton-over-proton spectrum is compatible with production of antiprotons from cosmic ray spallation interactions. We also provide a set of propagation parameters and scale factors to renormalize the cross sections parametrizations of B, Be, Li and antiprotons which allow us to reproduce (below 2σ uncertainties) all their ratios simultaneously.