

Combined analysis of AMS-02 secondary-to-primary ratios: universality of cosmic ray propagation and consistency of nuclear cross sections

Monday 19 July 2021 19:18 (12 minutes)

The AMS-02 collaboration released several secondary-to-primary ratios of unprecedented accuracy. These ratios can be used to test the universality of propagation for different species, and also to test the presence of breaks in the diffusion coefficient. It was shown in Weinrich et al. (A&A 639, 131, 2020) that the combined analysis of Li/C, Be/C, and B/C strengthens the case for a low-rigidity diffusion break. It was also shown that a standard propagation model successfully reproduces these ratios (and also AMS-02 N/O and 3He/4He data), without the need for additional sources of Li, Be, or B. However, significant modifications (~5-15%) of the production cross sections are required, though these modifications remain within estimated nuclear uncertainties. We also extend our analyses to the recently published F/Si ratio and discuss how much F at source can be accommodated by the data.

Keywords

cosmic rays; propagation;

Collaboration

other Collaboration

Subcategory

Theoretical Results

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Session Classification: Discussion

Track Classification: Scientific Field: CRD | Cosmic Ray Direct