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Energy spectra of nuclei from protons to iron in sources, according to the ATIC experiment

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One of the main results of the ATIC experiment is a collection of energy spectra of abundant cosmic ray nuclei –protons, He, C, O, Ne, Mg, Si, Fe measured in terms of the energy per particle in energy range from 50 GeV to tenths of TeV. In this report the ATIC energy spectra of abundant nuclei are back propagated to the spectra in sources in terms of magnetic rigidity using a number of GALPROP-based models of cosmic rays propagation. It is shown that the results of comparison of the slopes of the spectra are relatively weakly model-dependent within a set of studied models. It is shown that the helium spectrum in sources is flatter than the proton spectrum with high statistical significance. A regular growth of steepness of the spectra is found for a charge range from helium to iron, and this conclusion is also statistical significant. The results are discussed and compared with data of other modern experiments.

Collaboration

– not specified –

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