

Measurement of the Proton and Helium Flux in Cosmic Rays with the Alpha Magnetic Spectrometer: Results and Interpretations.

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We present a precision measurement of the cosmic-ray proton flux at rigidity from 1 GV to 1.8 TV and the helium flux at rigidity from 2 GV to 3 TV. The measurement is based on the data collected by the Alpha Magnetic Spectrometer experiment on the International Space Station. The two fluxes are found to progressively harden at rigidities larger than 100 GV, while the proton-to-helium ratio is found to steadily decrease with rigidity.

At rigidity above 45 GV, the ratio is remarkably well described by a single power law, with spectral index 0.077 ± 0.007 . We discuss some possible interpretations of these results in terms of astrophysical models of cosmic-ray acceleration and propagation.

Summary

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