

New results from the AMS experiment on the International Space Station

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The Alpha Magnetic Spectrometer, AMS, is a general purpose high energy particle physics detector. It was installed on the International Space Station, ISS, on 19 May 2011 to conduct a unique long duration mission of fundamental physics research in space. Knowledge of the precise rigidity dependence of the proton and helium flux is important in understanding the origin, acceleration, and propagation of cosmic rays. Precise measurements of the proton and of the helium flux in primary cosmic rays with rigidities (momentum/charge) up to the TV scale are presented and the detailed variation with rigidity of the flux spectral indices will be discussed.

A precision measurement by AMS of the antiproton flux and antiproton-to-proton ratio in primary cosmic rays in the rigidity range from 1 to 450 GV is presented. This measurement increases the precision of the previous observations and significantly extends their rigidity range. It shows that the antiproton-to-proton ratio remains constant above ~60 GV.

In addition new measurements of the cosmic ray electron and positron flux will be shown and the perspectives for the AMS physics program till the expected end of the lifetime of the International Space Station in 2024 will be discussed.

Presenter: SCHAEEL, Stefan (Rheinisch-Westfaelische Tech. Hoch. (DE))

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