

Precise Measurement of the Monthly Proton Flux with AMS-02 on the ISS

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The Alpha Magnetic Spectrometer (AMS-02) is a high-energy particle detector designed to perform fundamental physics research in space.

It was installed on the International Space Station (ISS) on May 19, 2011, where it will operate for the next decade.

During the first 30 months of operations, AMS-02 collected 41 billion events of cosmic rays between 1 GV and 1.8 TV.

In this work, we analyze the detailed time variation of the proton flux with a 27 days time-based integration i.e. Bartels rotation.

While at high energy the spectra remains stable versus time, the low-energy range exhibits a decreasing general trend, strongly reflecting the increase of the solar activity that recently reached its maximum.

In addition to the overall modulation effect, the monthly AMS-02 proton flux shows variations related to the short-time solar activity i.e.

Coronal Mass Ejections and Forbush decreases.

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