



AMS-02 Capabilities in Solar Energetic Particle Measurements for Space Weather Physics

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The Alpha Magnetic Spectrometer (AMS-02), thanks to its large acceptance of about 0.45 m² sr, is the biggest Solar Energetic Particle (SEP) detector ever flown in space. AMS-02 was installed on the International Space Station (ISS) on May 19, 2011, where it will measure cosmic rays from 1 GV up to a few TV, for the duration of the ISS, currently extended till 2024. During these years of operation, AMS-02 measured several increases of the protons flux over the Galactic Cosmic Ray (GCR) background associated to the strongest solar events. AMS-02 has observed the related SEP accelerated during M- and X-class flares and fast coronal mass ejections measuring an increase of the proton flux near 1 GV and above. Some of these solar events were also followed by the typical GCR suppression i.e. Forbush decrease, which makes even more evident the measurement of the SEP flux over the GCR background. Thanks to its large acceptance and particle detection capabilities, AMS-02 is able to perform precise measurements in a short period of time which is typical of these transient phenomena and to collect enough statistics to measure fine structures and time evolution of particle spectra. The events observed by AMS-02 since the beginning of its mission will be presented and some of the more interesting events will be shown. AMS-02 observations with their unprecedented resolution and high statistics, will improve the understanding of SEP behavior at high energies to constrain models of SEP production used in space weather physics.