

Solar Energetic Particles (SEP), Solar Modulation and Space Radiation: New Opportunities in the AMS-02 Era #2

Contribution ID: 8

Type: **not specified**

Solar modulation in a very quiet heliosphere

Monday, 24 April 2017 15:15 (25 minutes)

Solar activity was at its lowest level since the beginning of the space exploration era from 2006 to 2009. During this period, the PAMELA space experiment observed spectra for galactic protons and electrons down to 70 MV and 400 MV, respectively, during what is called an $A < 0$ solar magnetic polarity cycle. This provides the opportunity to study charge-sign-dependent modulation under very quiet heliospheric conditions. Drift theory for the solar modulation of cosmic rays predicts that the intensity of protons at the Earth is expected to show a different rate of recovery towards solar minimum when compared to electrons during $A < 0$ cycles. The solutions of a comprehensive three-dimensional drift model are compared to PAMELA spectra to authenticate the modelling approach and then it is used to make predictions of how cosmic rays are differently modulated. Computations are done down to 1 MeV for the mentioned period and are based on new very local interstellar spectra.

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Session Classification: Early Monday Afternoon