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Solar proton spectra during the 20 January 2005 event as evaluated from neutron monitor data and from comparison of balloon measurements with GEANT4 based Monte Carlo simulations

Abstract content

Energy spectra of solar protons during the 20 January 2005 event have been determined by using data of the neutron monitor network. The obtained energy spectra were extrapolated down to 100 MeV and used as input of the GEANT4/PLANETOCOSMICS code to simulate the interactions of cosmic ray particles in the atmosphere. The computations with GEANT4/PLANETOCOSMICS gave angular and energy distributions of secondaries (protons, electrons, positrons, muons, photons and neutrons) at various atmospheric levels for this event. The results of the Monte Carlo simulations have been compared with the results of cosmic ray balloon measurements, and with an iteration procedure the primary solar proton spectra have been adapted to minimize the difference between balloon measurements and simulations. We present the analysis method and show the obtained solar proton spectra (energy range from 100 MeV to a few GeV) which best fit both the balloon and the neutron monitor observational data.

If this papers is presented for a collaboration, please specify the collaboration

Summary

Reference

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