Geophysical Research Abstracts
Vol. 18, EGU2016-8076-1, 2016
EGU General Assembly 2016
© Author(s) 2016. CC Attribution 3.0 License.

Near realtime forecasting of MeV protons on the basis of sub relativistic electrons

Johannes Labrenz (1), Bernd Heber (1), Patrick Kuehl (1), Christos Sarlanis (2), Olga Malandraki (3), and Arik Posner (4)

(1) IEAP, Christian-Albrechts-Universitaet, Kiel, Germany (labrenz@physik.uni-kiel.de), (2) IsNet, Athens, Greece, (3) IAASARS, National Observatory of Athens, Athens, Greece, (4) Heliophysics, NASA Headquarters, Washington DC, USA

A major impact on human and robotic space exploration activities is the sudden and prompt occurrence of solar energetic ion events. In order to provide up to an hour warning before these particles arrive at Earth, relativistic electron and below 50 MeV proton data from the Electron Proton Helium Instrument (EPHIN) on SOHO were used to implement the 'Relativistic Electron Alert System for Exploration (REleASE)'. It has been demonstrated that the analysis of relativistic electron time profiles provides a low miss and false alarm rate.
High Energy Solar Particle Events foRecastIng and Analysis (HESPERIA) is a project funded within the European Union's Horizon 2020 research and innovation programme (PROTEC-1-2014 Call: Space Weather). Within this project the REleASE forecasting scheme was rewritten in the open access programming language PYTHON and will be made public.
As a next step, we have analyzed the possibility to also use, along with relativistic electrons (v > 0.9 c) provided by SOHO, near-relativistic (v <0.8 c) electron measurements from other instruments like the Electron Proton Alpha Monitor (EPAM) aboard the Advanced Composition Explorer (ACE). This would prove to be particularly useful during periods that SOHO does not provide continuous near real-time data. We show that the ACE/EPAM observations can be adapted to the REleASE forecasting scheme to provide reliable SEP forecasts. A comparison of measured and forecast proton intensities by SOHO/EPHIN and ACE/EPAM will be presented. In addition we investigated the false alarm rate and detection probability of solar ion events.
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 637324.