

A web application for monitoring cosmic rays and solar activity

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The flux of cosmic rays (CRs) in the heliosphere is subjected to remarkable time variations caused by the 11-year cycle of solar activity. This effect is known as solar modulation. A detailed modeling of the solar modulation requires a large variety of multi-channel and time-resolved data. We have developed a web application (Heliophysics Virtual Observatory) that collects real-time data on solar activity, interplanetary plasma, and charged radiation from several space missions, databases and observatories. The data are automatically updated on daily basis and stored in common formats such as ROOT objects, TXT and CSV files. Our application can be used to visualize, manipulate, and download updated data on sunspots, heliospheric magnetic fields, solar wind, and neutron monitors counting rates. A real time model for the energy spectrum of CR protons near-Earth is also provided. This simplified model has been developed under the Force-Field approximation using neutron monitor data to reconstruct the values of the modulation potential ϕ .

HVO can be a useful tool for the CR astrophysics and space physics community. Future development may include an improvement and extension of the real-time CR flux model, integrations of the latest numerical models of CRs transport in the heliosphere and the addition of other relevant data to a complete monitoring of the space weather.