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Coronal holes in the long-term cosmic rays modulation

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The present study of galactic CR modulation in the heliosphere through the 21-24 cycles continues the series of works, where long-term CR modulation was described using the multi-parametric model, including the solar activity (SA) characteristics. Initial data for modeling of CR variations are long-term observations of CR intensity, the characteristics of the solar global magnetic field and the short-time characteristic of SA (solar x-rays flares). Data of the CR intensity were obtained from the ground network of NM and stratospheric sounding.
In order to improve the simulation of long-term CR variations we introduced into the model the characteristic of the regions with the open magnetic field –the coronal holes (CH). Location (latitude), the area and the magnetic flux of CHs were used. Modeling modulation is carried out for all period and separately for the periods with the same polarity of the global field of the Sun, taking into account the delay CR variations regarding changes of CA characteristics.
The quality of the long-term variations description has been improved by including in the model the CH characteristics.

Collaboration

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