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Solar Cosmic Ray study with Neutron Monitors of a Various Design

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Abstract content

The modeled and observed responses of neutron monitors of two various types: the standard 3NM-64 and a leadless 4NMD one at the SANAE South African Antarctic station during a number of large GLE events were compared to precise the specific yield of the NMD at low rigidity range. The parameters of primary relativistic solar protons outside magnetosphere: rigidity spectrum, anisotropy direction and pitch angle distribution were determined on data of the worldwide NM-64 neutron monitor network by modeling technique. The modeling included: definition of asymptotic viewing cones of the NM stations under study by the particle trajectory computations in a model magnetosphere T01 (Tsyganenko (2001)); calculation of the NM responses at variable primary solar proton flux parameters; determination of primary solar proton parameters outside the magnetosphere by a least square procedure at comparison of computed NM responses with observations. Then the response of both neutron monitors NM64 and leadless NMD was calculated using the specific yield functions (SYF) obtained earlier in the latitude and high-altitude survey of both instruments (Stoker, 1985, 1994). By fitting to observations the SYF for the NMD detector was adjusted so that it precisely described the response of leadless neutron monitor during a number of GLE events.

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

Summary

Reference

Proceedings of the 30th International Cosmic Ray Conference; Rogelio Caballero, Juan Carlos D'Olive, Gustavo Medina-Tanco, Lukas Nellen, Federico A. Sánchez, José F. Valdés-Galicia (eds.); Universidad Nacional Autónoma de México, Mexico City, Mexico, 2008; Vol. 1 (SH), pages 213-216

Primary author(s) : Dr. BALABIN, Yury (Polar Geophysical Institute of RAS)

Co-author(s) : Prof. VASHENYUK, Eduard (Polar Geophysical Institute, Apatity, Russia); Prof. STOKER, Pieter (North-West University, Potchefstroom, South Africa)

Presenter(s) : Dr. BALABIN, Yury (Polar Geophysical Institute of RAS)

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