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SIGNIFICANT SOLAR PROTON EVENTS FOR FIVE SOLAR CYCLES (1954-2007)

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Abstract content

Using a solar proton database for the past five solar cycles (1954-2007) we have determined the total solar proton fluence above 10 and 30 MeV and the number of discrete events that occurred each cycle. We find: (1) The number of discrete events in cycles 19-22 were essentially the same; (2) Cycles 20 and 21,at the beginning of the space era, were relatively benign with respect to solar proton fluence; (3) Approximately 15% of the total number of discrete events each cycle are GLEs; (4) Cycle 23 has been the most active cycle since 1954.

We also find that both the number of discrete events and the total fluence can be associated with a relatively small number of solar active regions with each region producing several large events (i.e. sequences of activity). This is particularly true with solar cosmic ray events (GLEs). Of the 70 GLEs between 1942 and 2006, 15 active regions have been associated with 36 individual relativistic solar proton increases. Recent studies of historic events, particularly the geophysical phenomena from late August to early September 1859 indicate that these sequences of activity have occurred in the distant past.

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'Olivo, 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 261-264

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