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Acceleration and transport modeling in the solar energetic particle event of 2000 May 1

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Abstract content

Using instruments on the ACE and Wind spacecraft, we investigate the temporal evolution, spectrum, and ionization states of Solar Energetic Particle (SEP) Fe in the impulsive event of 2000 May 1. Proton and electron intensities and anisotropies were used to help constrain the characteristics of the interplanetary propagation taking account of focusing, pitch-angle scattering, adiabatic deceleration, and convection. We find that event was nearly scatter-free, with an interplanetary scattering mean free path of larger than 1 AU. The Fe spectrum spectral form is consistent with stochastic acceleration, but the observed increase of the ionization state of Fe between 200-600 keV/nucleon is larger than can be explained using a single temperature source even after including the effects of stripping and Coulomb losses. A two-temperature source region is required to fit the observed range of Fe charge states, with the bulk (>80%) of the particles coming from a 10ˆ6K region, and the remainder from a region with T ˜1.6 x 10ˆ7K.

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 79-82

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