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Unusual Solar Energetic Proton Fluxes at 1 AU within an Interplanetary CME

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Abstract content

In mid December 2006 several flares on the Sun occurred in rapid succession, spawning several CMEs and bathing the Earth in multiple solar energetic particle (SEP) events. One such SEP occurring on December 15th was observed at the Earth just as an interplanetary CME (ICME) from a previous flare on December 13th was transiting the Earth. Although solar wind observations during this time show typical energetic proton fluxes from the prior SEP and IP shock driven ahead of the ICME, as the ICME passes the Earth unusual energetic particle signatures are observed. Measurements from ACE, Wind, and STEREO show unusual proton flux variations at energies ranging from ˜3 MeV up to greater than 70 MeV. Within the Earth's magnetosphere Polar HIST also sees unusual proton flux variations at energies greater than 10 MeV while crossing open field lines in the southern polar cap. However, no such variation in the energetic proton flux is observed at the GOES 10 or GOES 11 spacecraft in geosynchronous orbit. Differential fluxes observed at GOES 12 in the 15-40 MeV energy range show some variation. However, the overall energetic particle signature within the ICME at GEO orbits remains unclear. This event illustrates the need for caution when using GEO data in statistical studies of SEP events and in interplanetary models of energetic particle transport to 1 AU.

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 179-182

Primary author(s) : MULLIGAN, Tamitha (The Aerospace Corporation, Space Science Applications Laboratory, Los Angeles, CA, USA)

Co-author(s) : BLAKE, J. Bernard (The Aerospace Corporation, Space Science Applications Laboratory, Los Angeles, CA, USA)

Presenter(s) : MULLIGAN, Tamitha (The Aerospace Corporation, Space Science Applications Laboratory, Los Angeles, CA, USA)

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