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OSSE satellite and neutron monitor observations of solar neutrons in association with 1991 June 4 flare

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Abstract content

Ions accelerated in solar flares interact with the solar atmosphere to produce gamma-ray lines and neutrons. Some of the neutrons that escape from the Sun into interplanetary space can survive to the Earth and be observed both by satellite detectors and by ground-based neutron detectors. In association with the X12.0 flare on 1991 June 4, solar neutrons were observed in space by OSSE onboard the CGRO satellite and by ground-based detectors, such as the 12m² neutron monitor at Mt. Norikura, Japan. Gamma-ray lines at 2.2 and 4.4MeV were also observed by CGRO/OSSE, and we can use the 4.4MeV line time history as the ion acceleration release time history. Using these gamma- ray line emissions, Murphy et al. (1997, 2007) calculated predicted time- dependent neutron spectra arriving at Earth using the solar flare magnetic loop transport and interaction model of Hua et al. (2002). Using the OSSE neutron response function, they compared predicted count rates with the observed OSSE count rates. In this paper, we calculate predicted time-dependent neutron spectra arriving at the Earth using the same model, and compare these predicted rates with rates observed both by OSSE and on the ground. We search for the best model to explain both observations.

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 37-40

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