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Solar neutrons and Particle acceleration at the Sun

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Abstract content

The Sun provides unique opportunities for studying particle acceleration mechanisms from Earth. Particles may be accelerated to high energies by the first-order Fermi acceleration, by second-order Fermi acceleration, or by DC acceleration. Differentiating between these possibilities is a fundamental problem of cosmic ray physics. In this talk, a brief summary of past solar neutron events that occurred on June 21st 1980, June 3rd 1982, May 24th 1990 and June 4th 1991 will be presented. A particularly informative event that was detected on April 15th 2001 (the Easter event) by a suite of instruments including the Yohkoh Soft X-ray Telescope (SXT) will also be discussed. In addition, relatively recent events that occurred during solar cycle 23 on October 28th 2003 and September 7th 2005 will be discussed. New results on proton spectra of GLE events will also be presented. These were obtained by Monte Carlo simulations using the well-tested GEANT 4 program. Our results imply that particles are frequently accelerated to over 10 GeV in solar flares by Fermi's first-order shock acceleration mechanism.

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

Summary

Reference

Primary author(s) : Prof. MURAKI, Yasushi (Solar-Terrestrial Enviroment Laboratory, Nagoya University)

Presenter(s) : Prof. MURAKI, Yasushi (Solar-Terrestrial Enviroment Laboratory, Nagoya University)

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