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Energetic neutrons from solar flares, a tool to study particle acceleration at the sun

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Abstract content

Summary

The Sun provides unique opportunities to study particle acceleration mechanisms using data from detectors placed on the Earth's surface and on board spacecrafts orbiting our planet. Particles may be accelerated to high energies by several physical mechanisms. Differentiating between these possibilities is a fundamental problem of cosmic ray physics. Energetic neutrons provide us information that keeps the signatures of the acceleration site. A summary of some representative solar neutron events observed on the Earth's surface, including X and gamma-ray observations from spacecrafts is presented. I will discuss evidence of acceleration of particles by the Sun to energies up to several tens of GeV. In addition, a recent solar neutron event that occurred in September 7th 2005 and detected in several observatories at Earth will be analyzed in detail.

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