



Generation of relativistic electrons during solar flares

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During solar flares electrons are accelerated up to high energies. They are responsible for the non-thermal radio and hard X-ray radiation. During the flare on October 28, 2003 an enhanced flux of γ -rays up to 10 MeV has been observed by the INTEGRAL satellite indicating the production of relativistic electrons. Magnetic reconnection is one of the possible mechanisms for flares. Hot jets appear in the outflow region of the reconnection site. If these jets penetrate into the surrounding plasma, standing shocks are established as seen in the solar radio data. Electrons can be accelerated up to high energies due to multiple encounters with such a shock. This process is described in a fully relativistic manner. If the highly energetic electrons travel along the magnetic field lines towards the denser chromosphere, they can emit hard X- and γ -ray radiation via bremsstrahlung. The theoretical obtained results are compared with the radio and γ -ray data of the solar event on October 28, 2003, since signatures of relativistic electrons have been observed during this event.