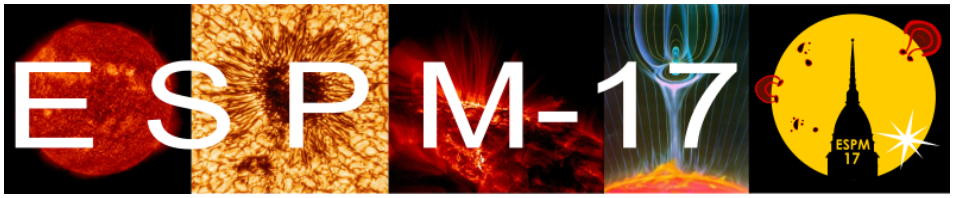

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On the Application of Warm Target Model in Investigating the Time Evolution of Solar Flares

Solar flares are intense localized eruption of electromagnetic radiation over a wide range of energies in the solar atmosphere. A primary characteristics of solar flares is the acceleration of electrons to higher energies and X-Ray observation serves as the key diagnostic to study them in details. In this study, we are investigating the time evolution of solar flares using the warm-target model. This model better constrains the flare parameters, especially the lower energy cut-off of the electron distribution, than the commonly used cold thick-target model. Here, we are using some well-observed flares observed by the RHESSI and the Solar Orbiter (STIX instrument) spacecrafts. Such observations provide us with an excellent opportunity to test the warm-target model in characterizing the time evolution of solar flares. The time evolution of some of the key parameters, e.g., the lower energy cut-off, the total power of non-thermal electrons, the rate of total injected electrons, the excess emission measure from the accelerated electrons in the warm plasma, are very crucial to characterize the acceleration mechanism of electrons in flares. We find an approximate constancy of the lower energy cut-off along the evolution of the flare. Such behaviour also plays a key role in the time evolution of the total non-thermal power of the electrons, and thus in their energy contain. The outcomes of this study, therefore, help us better understand the overall physics of the solar flares.

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