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Simulation of solar near-relativistic electron events associated with type II radio bursts

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Near-relativistic electron (E > 30 keV) events are observed in the near-Earth space following solar transient activity; e.g. flares and coronal mass ejections (CMEs). We have developed an inversion method for the analysis of the solar injection and interplanetary transport conditions of near-relativistic (NR) electrons observed by the EPAM instrument on board ACE.

We report on the results of our inversion method applied to a number of NR electron events temporally associated with type II radio bursts. We compare the inferred injection time-profiles with the timing of the electromagnetic emissions (X-rays, white-light and radio) observed during the parent solar events.

Preliminary results indicate that the source injecting particles may be active for a long period of time (> 3 h) and the timing of this extended injection coincides with the type II radio burst emission. This suggests that coronal shocks producing radio emission are responsible for the acceleration of NR electron events temporally associated with type II radio bursts.