

Name of research institute or organization:

Institut für Angewandte Physik, Universität Bern

Title of project:

Solar Sub-Millimeter Flare Observations with KOSMA

Project leader and team:

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Project description:

The process of electron acceleration during solar flares is still unknown and only few observations are available that allow its investigation at relativistic energies. The sub-millimeter wave emission is due to synchrotron radiation from relativistic electrons and thus carries important information about the electron distribution at high energies. Observations of the sub-millimetric flare spectrum with KOSMA (Köln Observatory for Sub-Millimeter and Millimeter Astronomy) at Gornegrat, together with our observations at millimetric wave lengths, are carried out to study the dynamics of electron acceleration.

So far one event has been observed at 230 and 345 Ghz (see activity report 2001), its analysis recently being completed. The most important results are: (a) that the sub-millimeter emission spectrum during one of the several acceleration phases was very flat (spectral index -0.9) and (b) that a late thermal phase persisted over several hours. Our analysis also showed that the accuracy of flux measurement can be considerably improved by using a multi beam setup that allows to pinpoint the location of the sub-mm flare source with an accuracy of better than a few arc seconds. As the position measurements can be made with millisecond sampling times also flare fragmentation can be studied. For this purpose a 3 beam receiver at 212 Ghz and optics for its incorporation into the KOSMA telescope was designed. Flare observation with this new instrumentation are planned during early summer 2003.

Key words:

Internet data bases:

Collaborating partners/networks:

Scientific publications and public outreach 2002:

Report

Thomas Lüthi und Andreas Magun, Rekonstruktion der Flussdichte des Flares vom 12. April 2001 bei 230 und 345 Ghz, IAP-Forschungsbericht Nr. 2002-6.

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