

Decimetric fine structures and associated X-ray flares

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Fernandes, F. C. R.; Kane, S. R.; Sych, R. A.; Andrade, M. C.; Cecatto, J. R.; Sawant, H. S.; Karlický, M.; Meszarosova, H.

Brazilian Solar Spectroscope and Ondrejov radio spectrograph operate, respectively, in the frequency range of 1250-1750 MHz and 800-2500 MHz. On 4 July 2003 the two instruments observed simultaneously radio bursts associated with two solar flares, one at ~ 1441 UT and the other at ~ 1637 UT. In both flares the radio bursts were found to be rich in fine structures. The first flare was associated with a C7.1 soft X-ray flare recorded by the GOES satellite from 1435 to 1520 UT with a peak at 1455 UT. An optical flare of importance 1F occurred during 1435-1439 UT and was located at N05,E32 in the active region 10400. During the period 1442-1508 UT the hard X-ray imaging spectrometer on RHESSI recorded slowly decaying hard X-ray emission in 10-20 keV range. X-ray emission at higher energies could not be recorded due to the presence of terrestrial (magnetospheric) energetic particles. 6-50 keV X-ray emission associated with the second flare (1637 UT) was recorded by RHESSI during 1630-1650 UT. The emission was characterized by several distinct maxima. Although no optical flare has been reported at the time of this flare, hard X-ray images obtained by RHESSI indicate that this flare occurred in the same active region (10400) as the first flare. An analysis of the decimetric fine structures has revealed positively drifting bursts in the frequency range of 1380-2000 MHz with positive drift rates of 180-- 600 MHz/sec at the beginning of the pulsating structures. Periodicity of pulsation was found to be about 9 sec. Detailed radio and hard X-ray observations of the two flares will be presented and the implications of these observations with respect to the location of the electron acceleration region in solar flares will be briefly discussed.

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