Observed flux density enhancement at submillimeter wavelenghts during an X1.2 flare

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We analyze the October 30, 2004 X1.2/SF solar event that ocurred in AR 10691 (N13 W18) at 11:38 UT. Observations at 212 and 405 GHz of the Solar Submillimeter Telescope (SST), with high time resolution (5 ms), show an intense impulsive burst followed by a long-lasting thermal phase. EUV images from the Extreme Ultraviolet Imaging Telescope were used to identify the possible emitting sources. Radio Solar Telescope Network (RSTN) data complement our spectral observations below 15 GHz. During the impulsive phase the turnover frequency is above 15.4 GHz, and the parameters of the emitting electrons are determinated using the gyrosynchrotron codes developed by Ramaty (Ramaty et al. 1994†). We model the coronal magnetic field of the active region using the Michelson Doppler Imager (MDI) magnetograms as boundary condition. This model allows us to explain the event in terms of a magnetic reconnection process. The long-lasting phase following the impulsive burst is analyzed in terms of thermal emission, its shape is compared with GOES soft-X ray observations.

† Ramaty, R., Schwartz, R.A., Enome, S., Nakajima, H., 1994, *Gamma-ray and millimeter-wave emissions from the 1991 June X-class solar flares*, Astrophysical Journal, 436, 941-949.