

SOME CHARACTERISTICS OF THE DEVELOPMENT AND EMISSIONS OF MAY 13, 1981 FLARE RELATED TO THE FLARE MODEL.

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ABSTRACT Proton flare of May 13, 1981 with various emissions and with registration of loop shaped flare in hard X-ray range above new created flare channel in $H\alpha$ and $H\beta$ is related with flare loop-model published earlier at IAU Symp. No. 35 in 1967.

OBSERVATIONS RESULTS

The brightness map in the line $H\beta$ (+0.026, -0.029 nm) as half the sum of the both wings of the active region in the time of flare (04 16 43 UT) was prepared. The velocity map is also evaluated from photometric data of the same line and wings. Very pronounced plasma rises (to -15 km s⁻¹) has been found along flare ribbons and also in the centre of the region. Both maps are published (Krivsky et al. 1989).

The flare picture in $H\beta$ (+ 0.18 nm) on Fig. 1 was combined with the hard X-ray loop 10-20 KeV registered with Hinotori system. The center of 35 GHz emission and the position of observed optical continuum is shown (Takakura et al. 1982, Hiei et al. 1982). All emissions are related to the new generated very bright flare channel in the $H\alpha$ and $H\beta$. The position of the flare near the solar limb allows an imagination of X-ray loop above the flare channel in the height.

RELATIONS TO THE FLARE MODEL

It seems very probable that all mentioned emissions and especially the X-emission figure were connected with areas of maximum release of energy in the shape of accelerated particle in both rooted foots below and especially in the top of the loop.

The result is in good agreement with earlier published flare model of triggering the accelerated particles on both bottom sides and on the top of flare loops (Krivsky 1968, Krivsky and Pinter 1975, Krivsky 1986). Such areas (Fig. 2) are regions of instability of the type X on the sides, or O on the top. Especially the flare top system with the type O can be very productive as the result of two anti-streaming systems of fast particles and waves from the points N_1 and N_2 up to height. Symmetrically streaming particles below are connected with generation of white flare on the photosphere. The occurrence of instabilities of the type X in the chromosphere or in the transient region can

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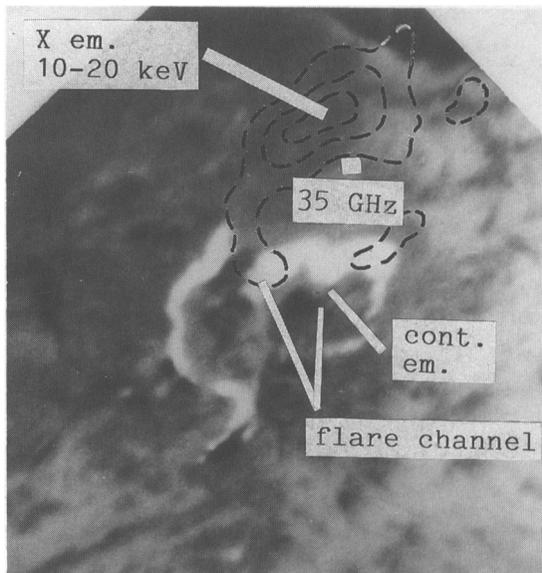


Figure 1: The flare in $H\beta +0.18 \text{ nm}$ (04 04 52 UT) combined with X-emission picture from Hinotori

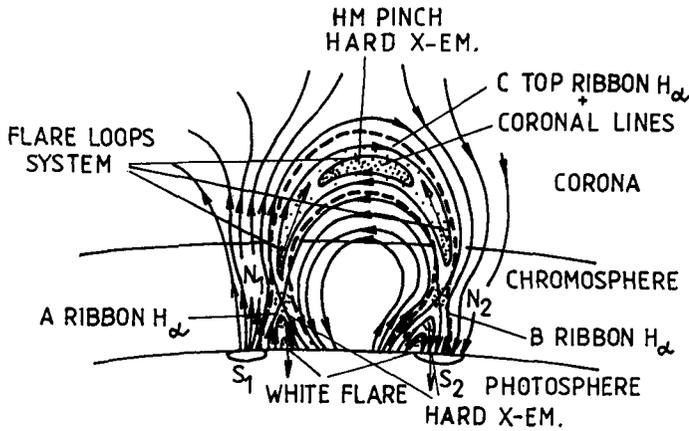


Figure 2: The topology in the cross-section of the arcade flare-loop system. New magneto-plasmic opposite system is lifted from the photosphere. The main phase is only given.

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