THE ANALYSIS OF THE UNDERESTIMATED EVENTS

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EXTENDED ABSTRACT. The aim of this paper is an analysis of individual strong X-ray flares, which may not be predicted succesfull by aplying the sunspot group flare activity characteristics for preceding day.

We introduce the notations fs and fh for maximum values of solar X-ray flux in range 1 - 8 Å and 0.5 - 4 Å, respectively. Fs anf Fh are sums of fs and fh values for individual flares observed in sunspot group on a given day.

We make the following asumptions: first we suppose that Fh is a good predictor for strong X-ray flares occuring the next day, and secondly, that the precursor (e.g. the increase of the fh value for faint solar flares) occurs in a time interval shorter then 24 hours before the event. As a consequence some number of strong X-ray flares may not be predicted properly for next day.

We have examined the flare activity process of a given sunspot group, during the time interval of 30 hours, before the onset of each from 100 X-ray considered flares (class $\geq$ M1). Our examination was limited to the strong flares, which occured in sunspot groups of types D, E, F, observed in 1980.

We introduce the index h in the form as follows:

$$h = \frac{[fh]_6}{[fs]_6}$$

where fh_6 is the sum of fh values, and $[fh]_6$ is the sum of fs values both, obtained for six-hour time intervals in sunspot group. For each analysed flare the zero time corresponds to flare maximum. The values of index h have been calculated in the nine concesutive six-hour time intervals. These intervals were slided back every three hours up to 30 hours.

We assumed that the values of index h increase frequently during time interval shorter than 24 hours before the strong X-ray flare.

It is important to know whether this affect is statistically significant.

To check this question we investigate additionally the set of 308 solar flares classes as $\leq$C4. The flare set was choosen as previously, for sunspot groups D, E, F but now in these groups the flares $\leq$C5 did not occure neither the given nor the next day. That means that we take into consideration the sunspot groups with very low flare activity. The mean value of index h is now equal to:

$$\langle h \rangle = \frac{\sum_{308} fh}{\sum_{308} fs} = 0.038$$

As a critical value we set $h_c = 0.04$, and so we assume that the given strong ($\geq$M1) flare is announced if during six-hour intervals the values h were in excess of the critical value.

The bulk of hundred investigated X-ray flares (88) were announced in time interval shorter than 24 hours before their appearance.

So, we may conclude that when for a given class of X-ray flares the flux (0.5 - 4 Å) is strongly enhouced we can expect stronger flare activity.

The result will be published in more detailed form probably in Solar Physics.