

THE PROBLEMS OF THE SHORT-TERM SOLAR PREDICTION PROCEDURE

M. Jakimiec
Astronomical Institute of Wroclaw University
Wroclaw, Poland

EXTENDED ABSTRACT. The homogeneity investigation of the population of the predicted variables characterizing X-ray flare activity is the aim of this paper. Problem of the choice of the active region characteristics and of the appropriate variable construction is the very crucial point at the beginning of the prediction procedure. The homogeneity of the population is a condition which the variable should satisfy to be useful in the prediction procedure. This condition is specially important when the multivariable population is employed in the prediction procedure. The choice of the not most appropriate subset of the predicting variables may be an unavoidable consequence of the flare population unhomogeneity.

The variables characterizing hard X-ray bursts (25-500 keV, detected with HXRSB on SMM), the softer X-ray fluxes (in ranges 1-8 Å and 0.5-4 Å, detected on GOES) and the H α flare data, were analysed. The sample size is N = 1080.

We found that the choice of active regions, the preference of stronger solar X-ray flares, the gaps in soft X-ray and H α flare observations and the unstationarity of the solar cycle, do not act as the sources of the solar flare population unhomogeneity.

Using the common factor analysis method we have investigated the structure of the interconnection among the considered variables. We found that the unhomogeneity of the flare population is not connected with H brightness classes (F,N,B) but is caused by the X-ray flare flux differences. For the faint X-ray flares the hard and soft X-ray emission are uncorrelated. For the strong flares (classed as C8) the correlation between hard and soft X-ray fluxes was evident.

We conclude our study giving following statements: 1. The appearance in the interconnection structure among the investigated solar flares characteristics mean that solar flares are conditioned by three different physical agents. 2. There is the unhomogeneity of the flare population which consists in the

interconnection structure differences for very faint and strong solar flares.
This fact has quite serious meaning for further investigations.
This paper will be published in more detailed form.