

SOME NOTES TO AN ACTIVE REGION WITH LARGE FLARES

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ABSTRACT The active region configuration and appropriate flare model are briefly discussed with respect to the reoccurrence of homologous flares.

НЕСКОЛЬКО ЗАМЕЧАНИЙ К АКТИВНОЙ ОБЛАСТИ С МОЩНЫМИ ВСПЫШКАМИ. Кратко оцениваются топология активной области и подходящая всплещечная модель с точки зрения гомологических всплещек.

NĚKOLIK POZNÁMEK K AKTIVNÍ OBLASTI S VELKÝMI ERUPCEMI. Stručně je diskutována topologie aktivní oblasti a erupční model se zřetelem na výskyt homologických erupcí.

The studied active region was a part of a typical sequence of large sunspot groups (Kotrč, 1976) with all characteristics of this phenomenon. The active region had a complicated magnetic configuration characteristic of group producing large solar flares. A number of flares were observed in this group, the largest of which occurred on June 3, 1979 (importance 2N), June 4, 5 and 10 (all 2B). The observational material used was obtained in cooperation of the Hvar and Ondřejov observatories. The first outburst at the photospheric level already began on June 1, when the new spots D and M appeared in the central part of the old sunspot group (see fig 1). In their neighbourhood, an extensive region of rudimentary penumbra formed at the same time. The subsequent development of the group displays a mighty activity outburst in the eastern and central part of the group. Above all, the patterns of rudimentary penumbra grew in between spot D, the newly formed spot C and the old spot A. The irregular and, in some parts, diffusive structure of the penumbra indicates a very complicated magnetic situation formed as a consequence of the newly emerging dispersed magnetic flux. The chromospheric and photospheric situation including some pictures of the flares are recorded on figs 2 and 3. The more detailed investigation of the active region described will be soon published in the Hvar Observatory Bulletin, (Kotrč and Suda, 1986).

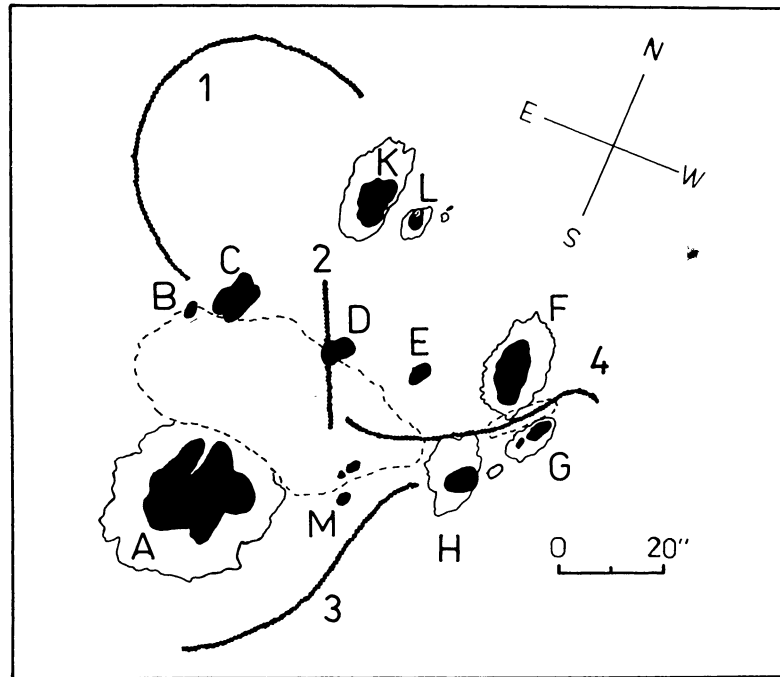
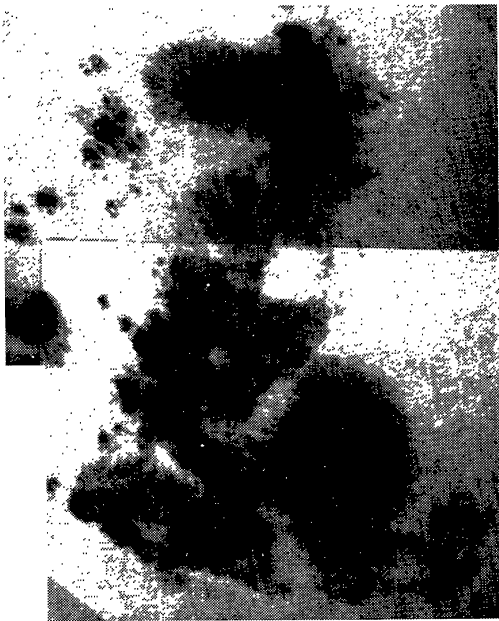
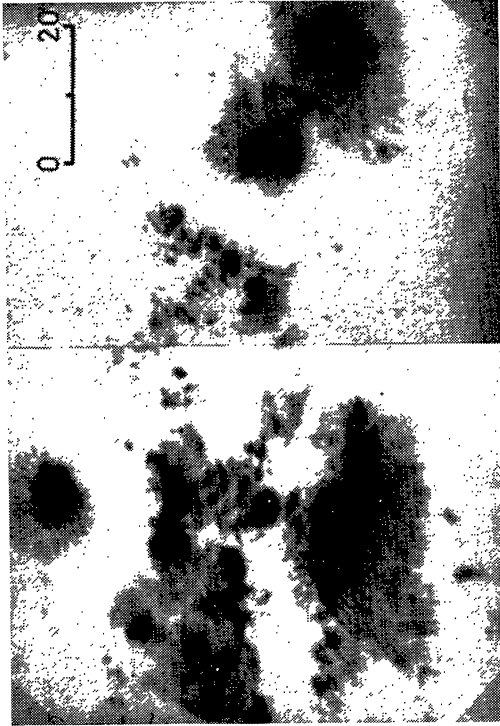


Fig 1 A schema of the Mc Math 16051. The spots are denoted by letters, the filaments by numbers, the dotted curves mark areas of irregular penumbra.

In the active region development we observed the coincidence in time and place of the photospheric penumbral fibrils formed under the chromospheric filament before and during the large chromospheric flares. In this case, the photospheric penumbral fibrils run parallel with the filament, although the filament is located in the upper chromosphere and lower corona. This configuration can be seen between spots F and G, and in the neighbourhood of spot D on June 3, 4 and 5. The large flares of June 3 and 5 were homologous, i.e. they appeared and brightened at almost exactly the same position and showed the same geometrical outline. We can see the filaments, denoted in fig 1 by numbers 3 and 4, are the axes along which the flare ribbons are positioned. The relations between the active region phenomena could be tentatively explained in terms of Van Tend's and Kuperus' model (1978). The homologous character of the flares observed shows that the field configuration can reach a certain stable stage during the evolution of the active region, that this is not too seriously affected by the occurrence of flares and that the field can regain its previous character after the flare has disappeared. If further magnetic field changes occur, the situation may reoccur and further flares may follow, but the stable magnetic field configuration does not allow them to change their shape.

REFERENCES

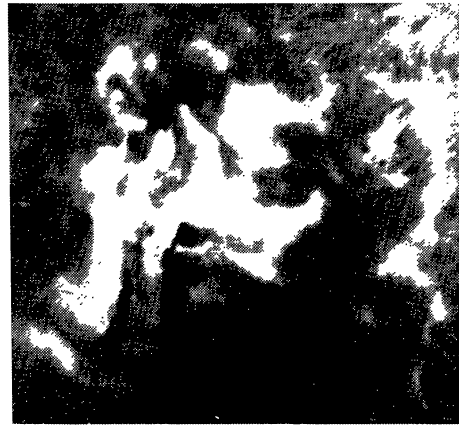
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Fig 2 /top/ White light pictures of Mc Math 16051 on June 3 and 5, 1979
 Fig 3 /bottom/ H-alpha filtergrams of Mc Math 16051 during the main homologous flares