

At about the time of the maximum cosmic ray effect particles of lower energy begin to arrive isotropically from all directions. These latter are believed to reach us by diffusion and reflection from disordered plasma fields which are present as well as the ordered radial fields in the Sun-Earth space.

R. Lüst. I would like to say that the observed east-west asymmetry of the flares producing cosmic rays could also be explained by a twisted magnetic field which does not extend to the Earth.

9. THE SOLAR MAGNETIC FIELD IN PLAGE REGIONS

R. B. Leighton

The study of solar magnetic fields in plage regions using a photographic technique (Leighton, *R. B., Ap. J.* **130**, 366, 1959) reveals a close geometrical relationship between the bright emission of Ca^+ and magnetic fields. All regions showing magnetic fields of greater strength than the 20-gauss limiting sensitivity of the apparatus also show Ca^+ emission. The bipolar nature of spot groups is clearly revealed, even when no spots of one polarity are present. The field outside spots has a filamentary, patchy appearance. The widely scattered remnants of old spot groups can be seen as patches of magnetic field, each polarity covering a large area.

The fine structure of the magnetic field has been studied, and small tubes of force have especially been looked for. There is no evidence that the magnetic field passes between the granules in small disconnected tubes of force. Tubes as small as 2" should have been visible if they were present, and if their field strength were as large as perhaps 50 gauss.

DISCUSSION

M. K. V. Bappu. I should like to ask whether the correlation between Ca^+ plage structure and the spatial magnetic field is of a type in which one can assume that actual changes in plage structure denote actual changes in the magnetic field spatial distribution. If it is so, Ca^+ spectroheliograms of the Kodaikanal series of several flares do not show any changes in the calcium plage structure before, during and after flares and, hence, may be considered to indicate that perhaps flares do not actually upset the magnetic field distribution pattern.

R. B. Leighton. Yes, there is a correlation between intensity and magnetic fields in the plages.

R. Michard. What is the magnetic difference between Ca^+ and $\text{H}\alpha$ plages? Do the $\text{H}\alpha$ plages represent regions of transverse and the Ca^+ plages regions of longitudinal fields?

R. B. Leighton. This we do not know.

A. B. Severny. According to W. E. Stepanov there should be a relation of that kind.