Elliot, H.: For myself, the answer to Prof. Alfvén's question would be that, to a first approximation, I take the sunspot minimum spectrum as the galactic spectrum. I would, however, reserve the right to speculate about how this spectrum differs from the true galactic spectrum.

Sarabhai, V.: I am very puzzled by the relative lack of particle events observed on the earth, which are not associated with solar events on the side facing the earth. Would you like to comment on how this can be explained on your model?

Gold: I am too. Any false identification would of cource distort the statistics so as to increase the proportion of flares observed to PCA events. I doubt, though, that there could be sufficiently many false identifications. Another possibility would be that gradient drifts take protons from east to west on the sun and not the reverse. This would require some consistent sense of the solar field. In that case particles librated to the east of the preferred solar meridian would drift around to it, but much less motion in the opposite sense could occur. Particles generated for to the west of this meridian would then be unable to reach it.

Sekido, Y.: I agree with your picture of interplanetary magnetic field, which explain comprehensive phenomena of solar particles. But I want to see on the blackboard, if possible, your picture of the interplanetary magnetic field responsible for Forbush decrease.

Gold: By the expansion of magnetic field regions, whose internal flux is "cooled" by the expansion. Dr. Kitamura discussed such a process.

Singer, S. F.: It seems to me to be important in any model which attempts to account for a number of observations to show that there are no inconsistencies. For example: What is the special distribution, the scale and strength of the magnetic inhomogenuities which must give (i) the initial *directional* incidence of solar high energy protons; (ii) the very rapid approach to isotropy, (iii) the proceeding Forbush decrease.

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II-5-20. General Discussion on Interplanetary Plasma

Discussion

Rossi, B.: We found experimentally two different kind of regions in interplanetary space. One is the region where there is very dense plasma and no magnetic field. The other is the region where there is no plasma but magnetic field. There is approximately an energy density balance between these two regions. It looks as if we had something like a succesive shells, one inside the other, separated by regions where the pressure is provided by magnetic field.

Gold, T.: A pressure equilibrium requires an anti-correlation between pressure and field, as is observed. If any unevenness is set up in the plasma then it would quickly jump into the observed anti-correlation.

High Mach number MHD flow is not yet well understood, but a turbulent pressure and uneven density distribution is required behind a shock front. Perhaps we are here seeing these instablities.

Rossi: Would it grow to produce practically vacuum between them?

Gold: I think the pressure ratio just depends on Mach number. And the Mach number is higher, then the pressure ratio is higher.

Elliot, H.: It seems to me that if one starts out with a mixture of solar plasma and solar magnetic field then segregation of these two forms of energy at a later time is contrary to the 2nd law of thermodynamics. Is it not a simple explanation that we have highly conducting plasma penetrating on external field?

Parker, E. N.: It has been suggested that there may be hydrostatic equilibrium across the regions of plasma and the regions of field observed from Explorer X in interplanetary space. If that is true, the temperature of the plasma must be of the order of $10^{6}°K$, because the field is 2×10^{-4} gauss and the plasma density between the regions of field is perhaps $15/cm^{3}$. This temperature implies that the gas is vigorously heated, presumably by shocks etc, as it expands outward through interplanetary space.

Rossi: It seems to be a little difficult to assume a kinetic energy of temperature as high as $10^{6}°K$.

Gold: If the differentiation into different regions is a consequence of high Mach number magneto-hydrodynamic collision of gas flow, then one would expect that gas pressure would have to develope in the back of any shock wave and would have to be associated with, in the first place, some turbulent structure which gradually degrades into genuine temperature but which has a pressure equivalent to something like $10^{6}°K$. It seems that the theory of magneto-hydrodynamic wave would give one situation where just behind shock wave there is some turbulent assembly whose turbulent pressure is the same order as that of the same gas density. I don't think these figures are very far out of mind from such a point of view.

Rossi: May I ask one question to theoretist? One of the problems that puzzles me is large difference between the velocity by which disturbance seems to propagate between the sun and the earth and the velocity of the particles that was found when a disturbance arrived. Would it be really too simpleminded to say that since the medium is an homogeneous, the disturbances propagate obviously with velocity of flight in the region where there is no plasma and with the proper velocity in the region where there is plasma? (Note: There was no satisfactory answer to the questioner.)

Chasson, R. L.: Can the theorists estimate the number and extent of the stirrations of magnetic field and plasma density in the magnetic storm cloud?

Parker: Not enough known about the phenomenon to make a guess.

Hayakawa, S.: If particles are accelerated by a shock wave, the particles accelerated may be nearly isotropic rather than being directed towards the earth. Did you observe such a directional dependence?

Bridge, H. S.: We have examined all the data for directional dependence in a preliminary way. One can say that the direction shows no change greater than about 15°, *i.e.* the plasma always comes roughly from the sun. This includes the 6 hour period after the sudden commencement. The accuracy of the directional data will be greatly improved when the analysis is complete.