The Latitudinal Distribution of Magnetic Holes in the Solar Wind

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A large number of magnetic holes have been found in the Ulysses data during its cruise in the ecliptic. They are interpreted as convecting structures, probably caused by the mirror instability which exists in high β plasmas with anisotropic temperatures. The characteristics of the holes reflect the solar wind condition of the region in which the holes arc formed, and the point of observation may bc far removed from where the instability occurs. A preliminary survey appears to indicate that the number of holes has no significant radial dependence. However, the number of holes dots appear to increase with increasing heliographic latitude. Yet the large scale solar wind structures with their compression regions disappeared at ≈ 57° south latitude. Thus any causal relationship between the holes and large scale solar wind structures is questionable. The temperature anisotropy and high β required by the mirror instability must be generated by other mechanisms.

In order to tic the magnetic holes and the mirror instability to their cause, the evolution of their characteristics with heliographic latitude needs to bc investigated further. The progression of Ulysses from the equator of the sun to its pole and the return to the equator allows such a study. A comparison of the results with the solar wind conditions and structures may lead to the identification of the magnetic hole generating mechanism(s).

1. 1995 AGU Spring

2. 001237177

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4. SH

5. (a) SH03 Ulysses pole to equator

(b) 2134 Interplanetary magnetic fields, 7524 Magnetic fields

6. N/A

7. 50'% (AGU Fall '94)

8. VISA 405000323029
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9. C

1 (). N/A

11. No