

AUTUMN COLLEGE ON PLASMA PHYSICS

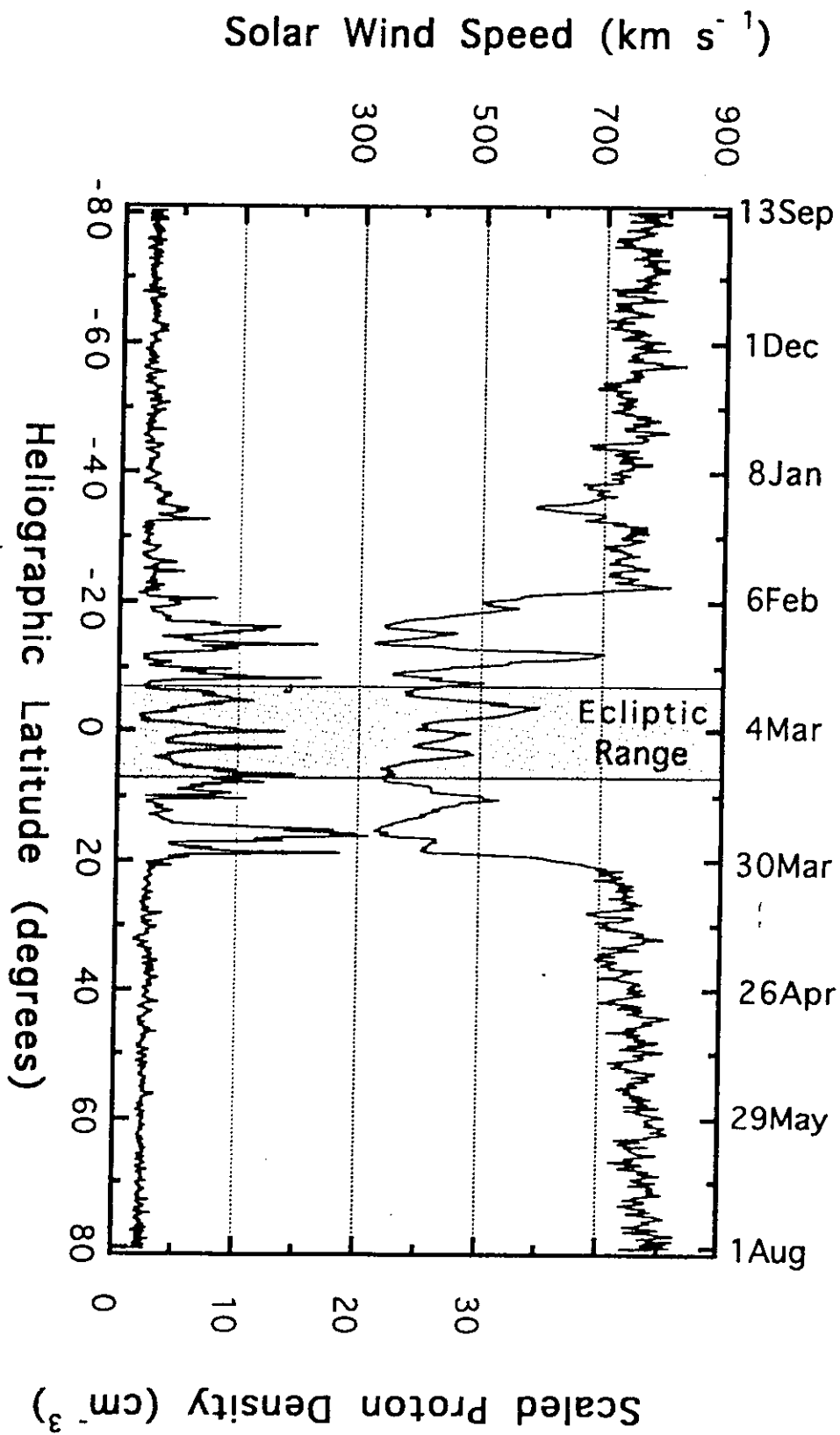
25 October - 19 November 1999

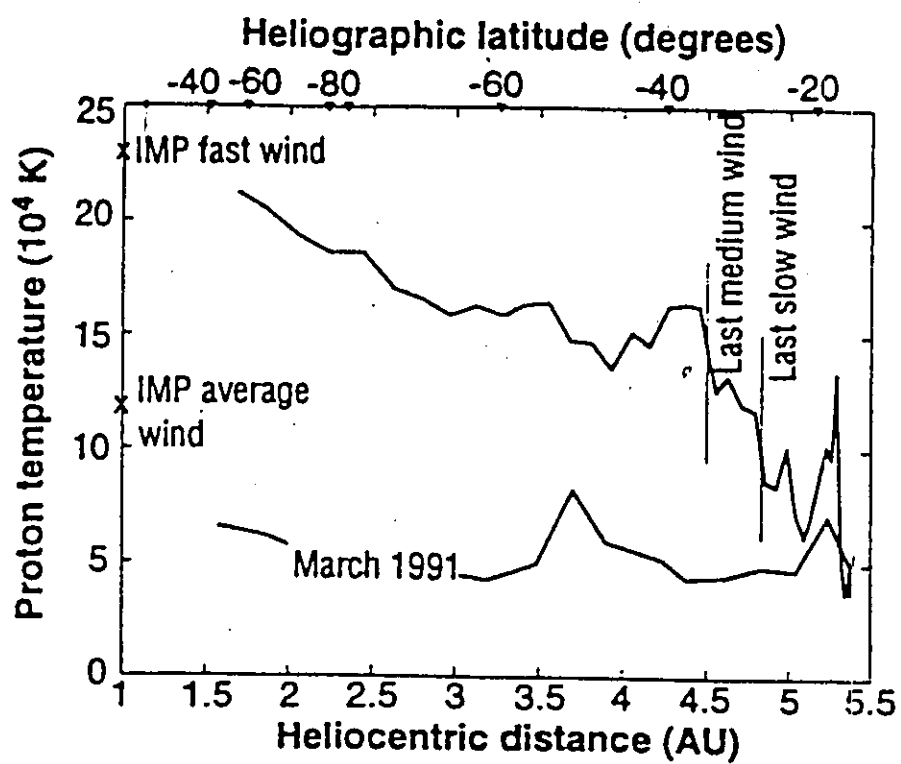
The 3d Heliosphere: Ulysses results

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These are preliminary lecture notes, intended only for distribution to participants.





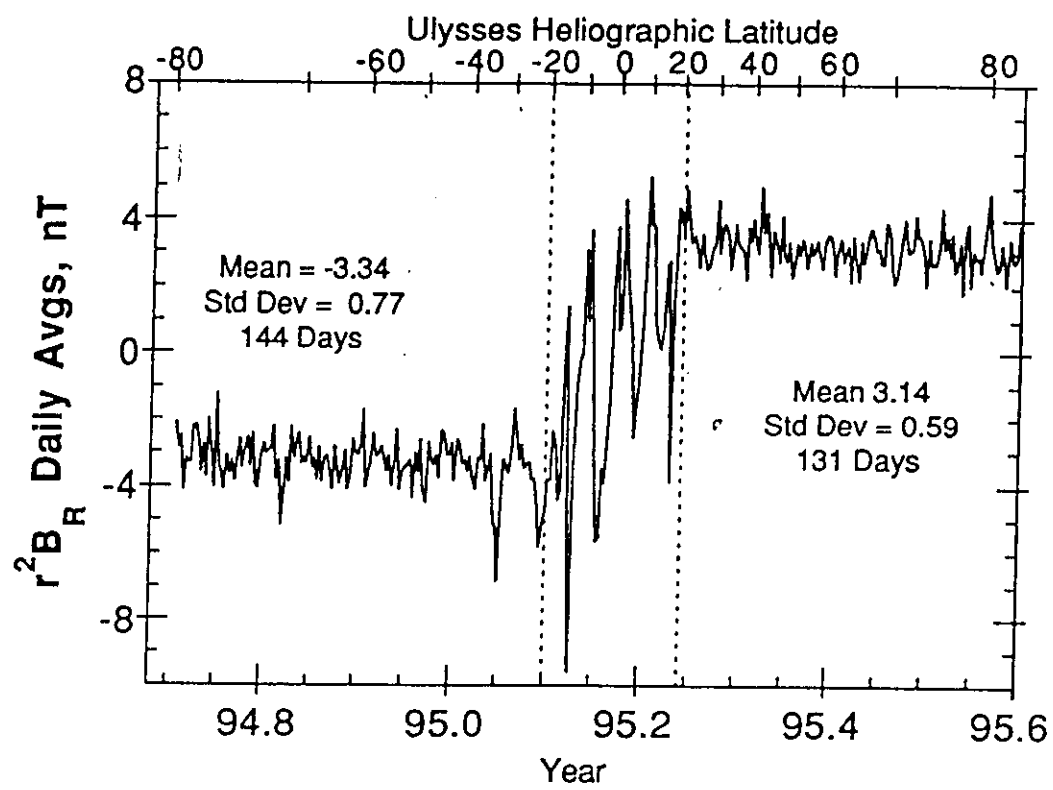


Figure 1

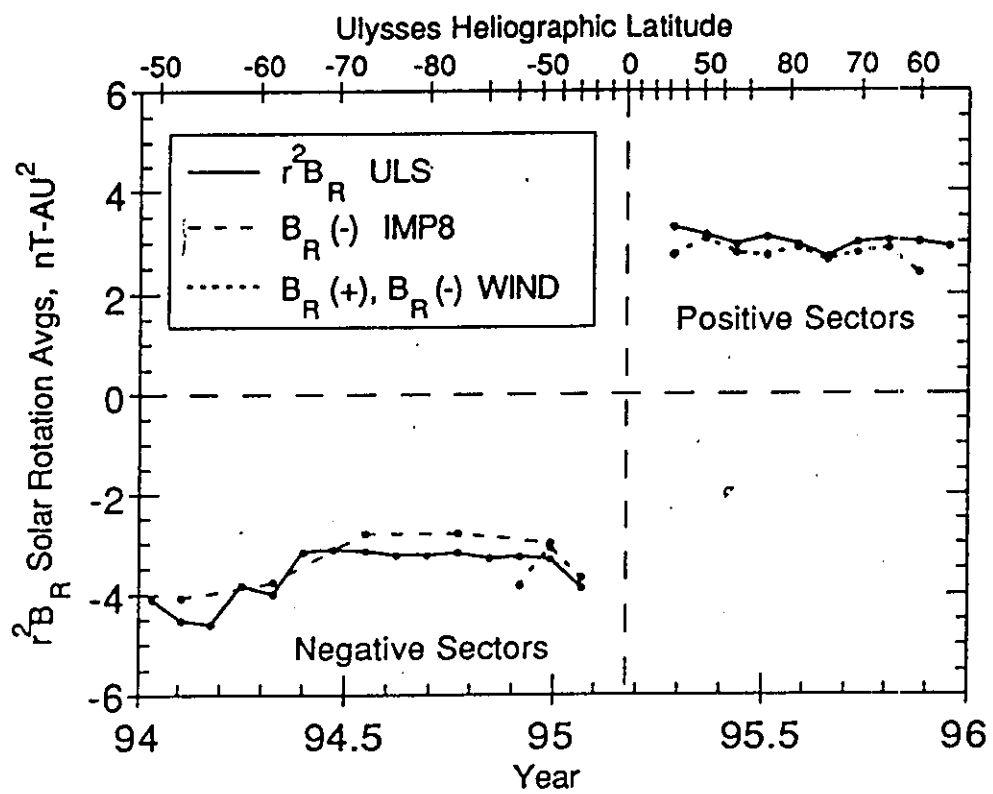
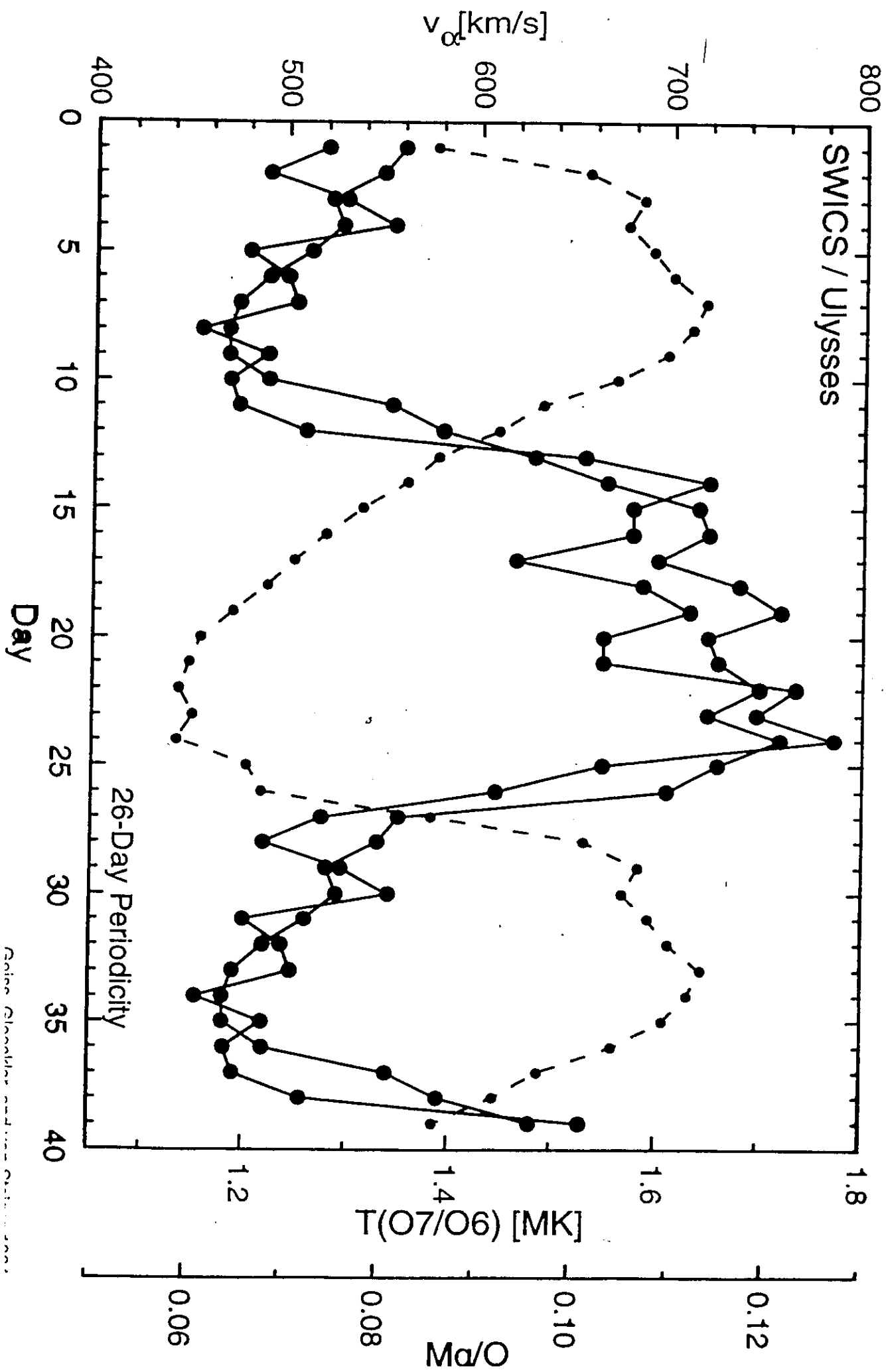
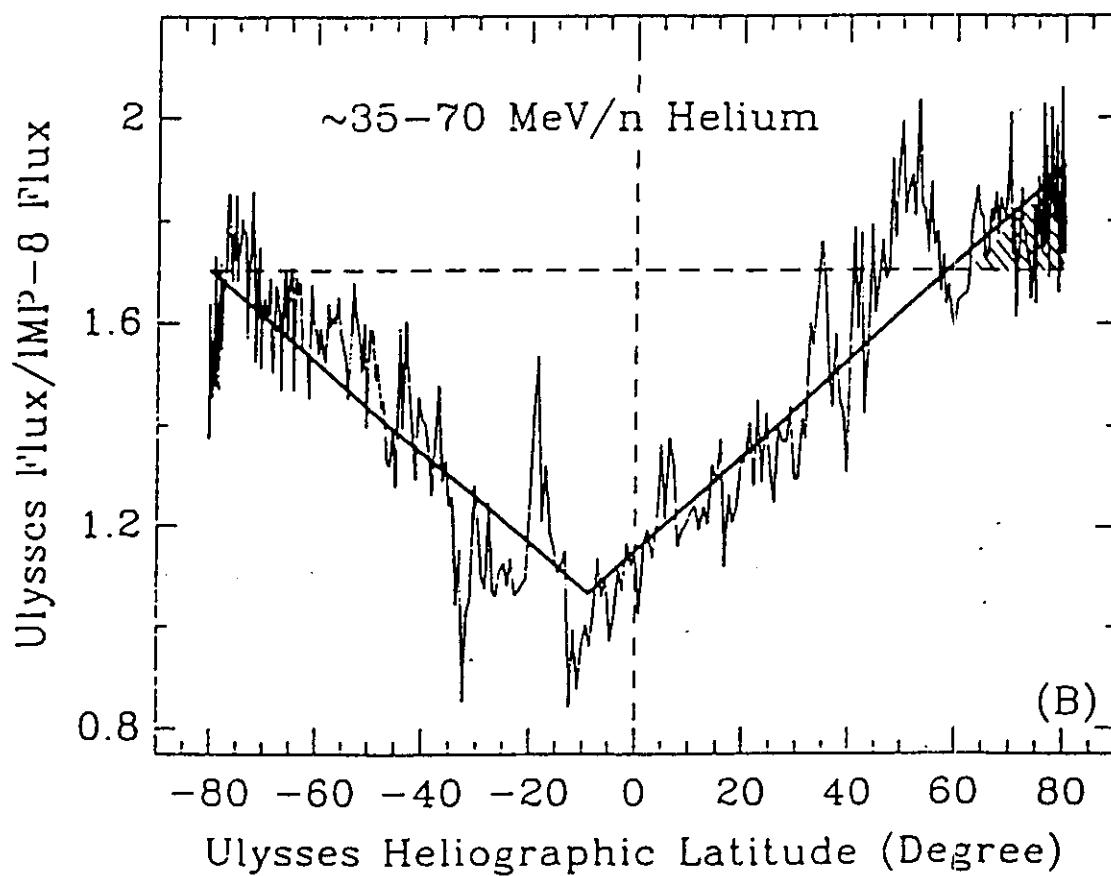
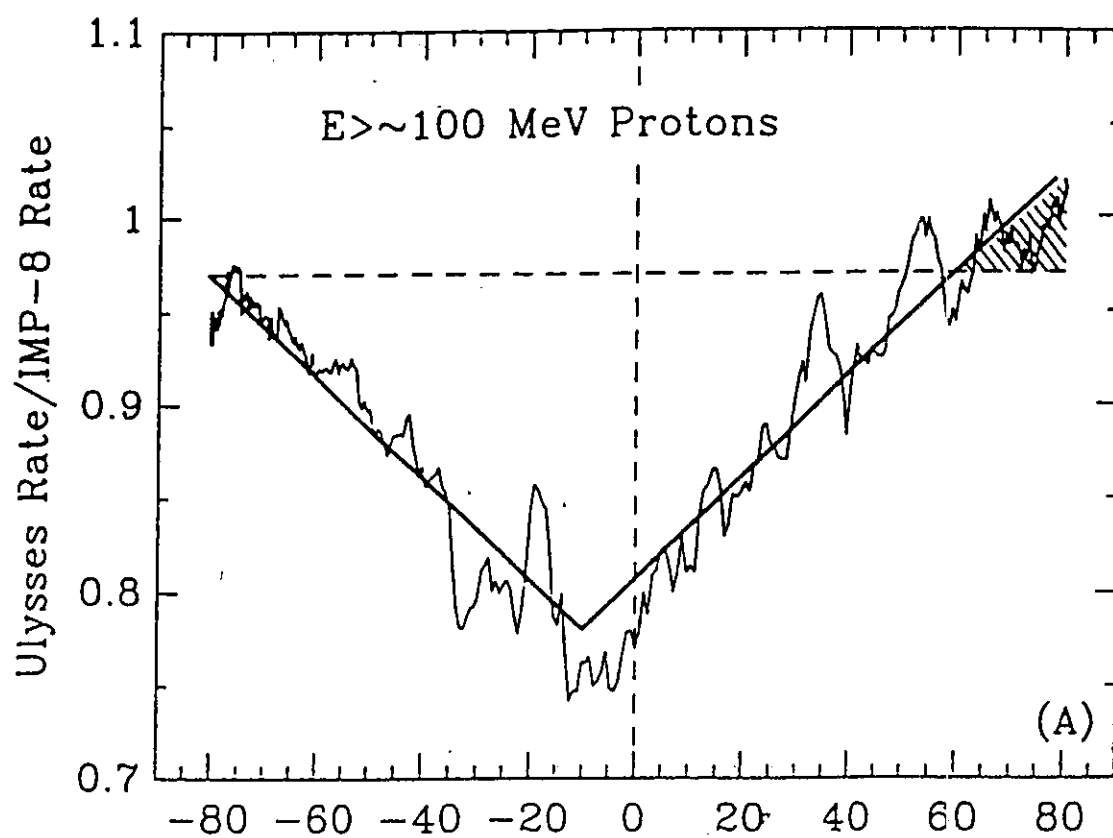
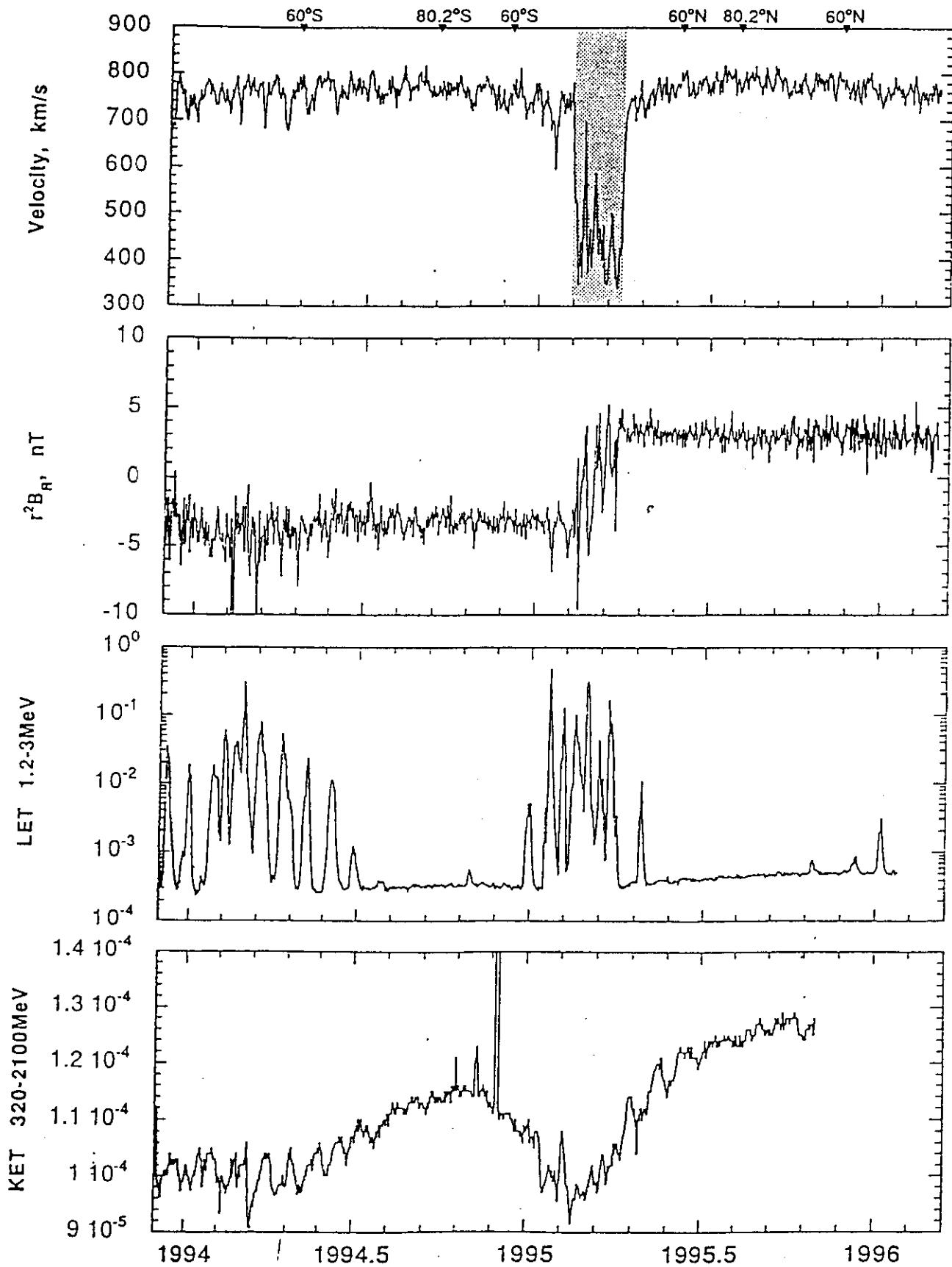


Figure 2



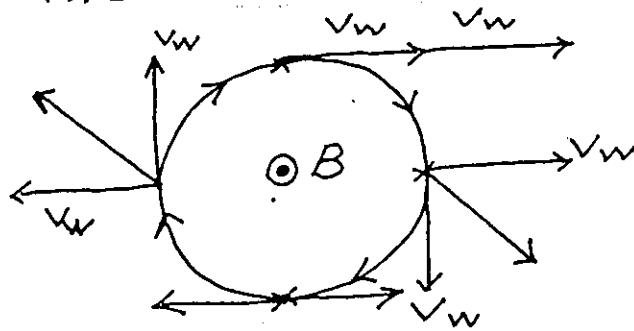


ULYSSES High Latitude



Ion Pickup by the Solar Wind

- When the ion is created, it is at rest in the inertial frame.
- It senses $\vec{B}$ which is moving past the ion at the solar wind speed, v_w .
the ion gyrates around $\vec{B}$ at speed, v_w , in solar wind frame.
i.e., the thermal speed is v_w (hot).
- To find the ion motion in inertial frame, add the solar wind velocity.



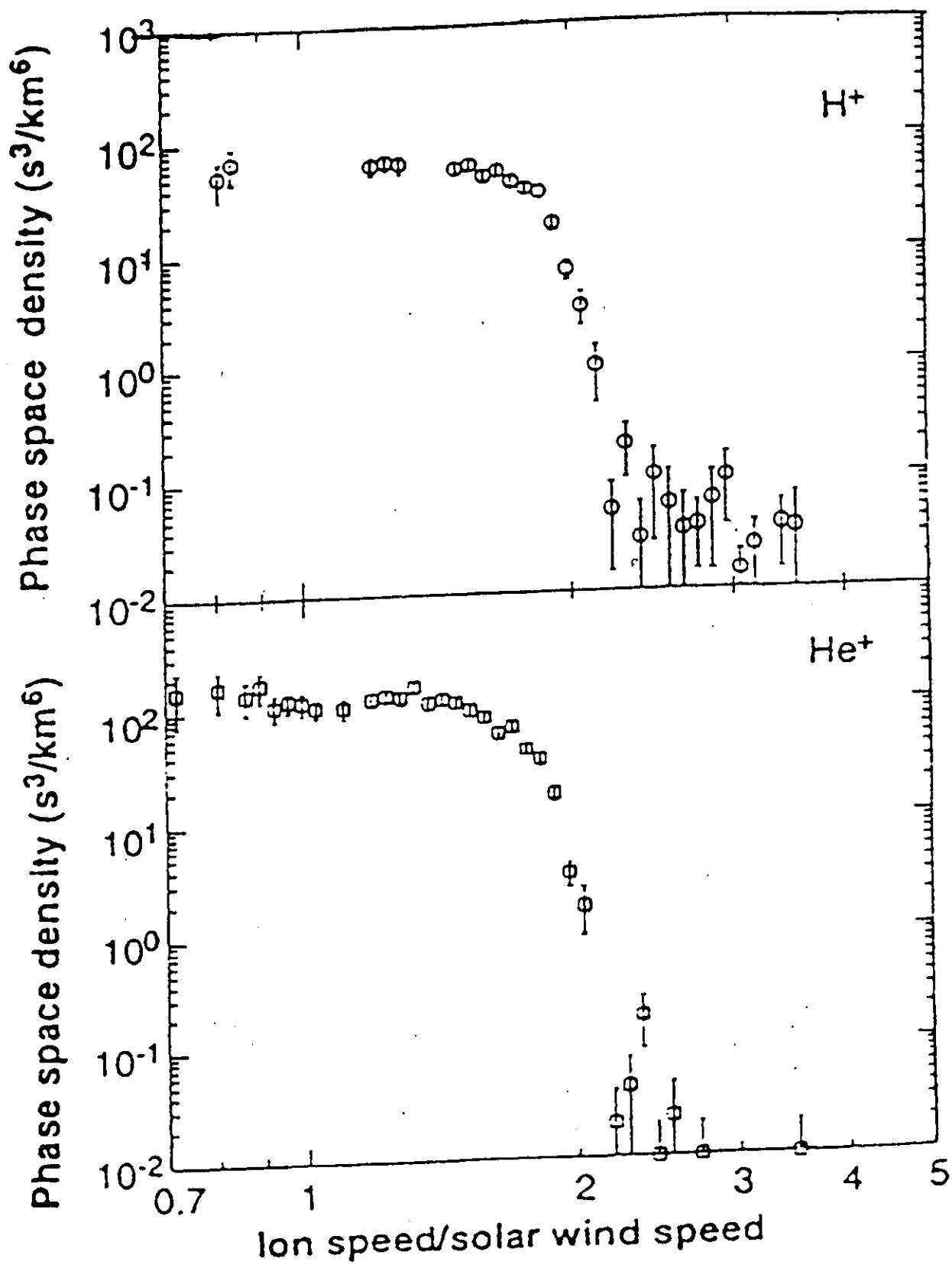
— the motion is cycloidal:



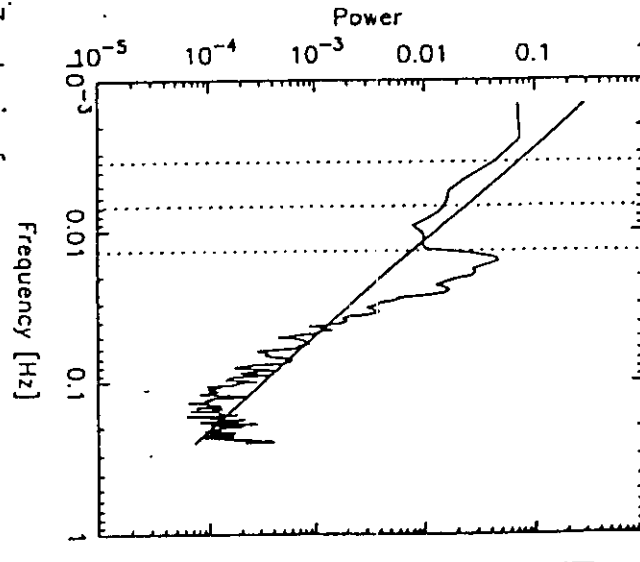
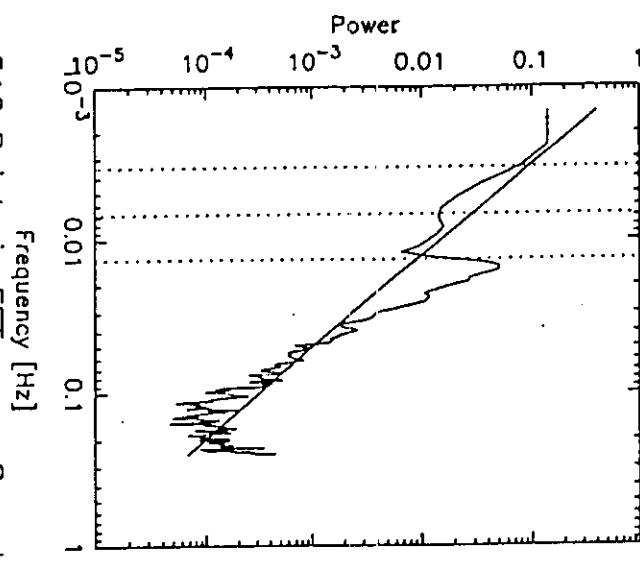
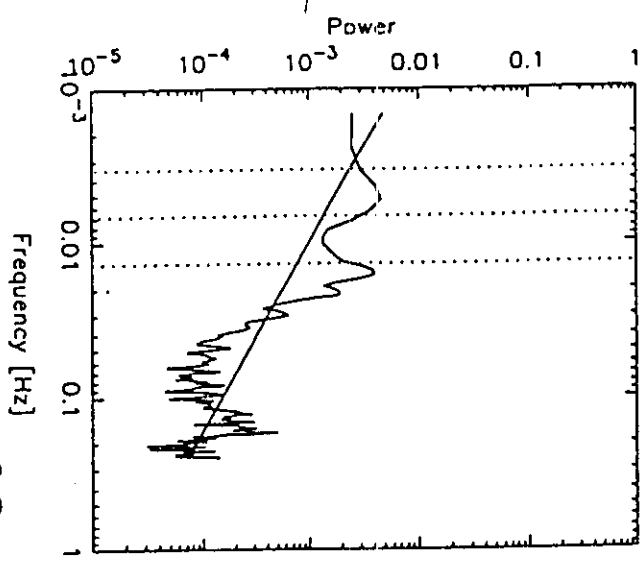
— At troughs, $v = v_w - v_w = 0$.

— At peaks, $v = v_w + v_w = 2v_w$.

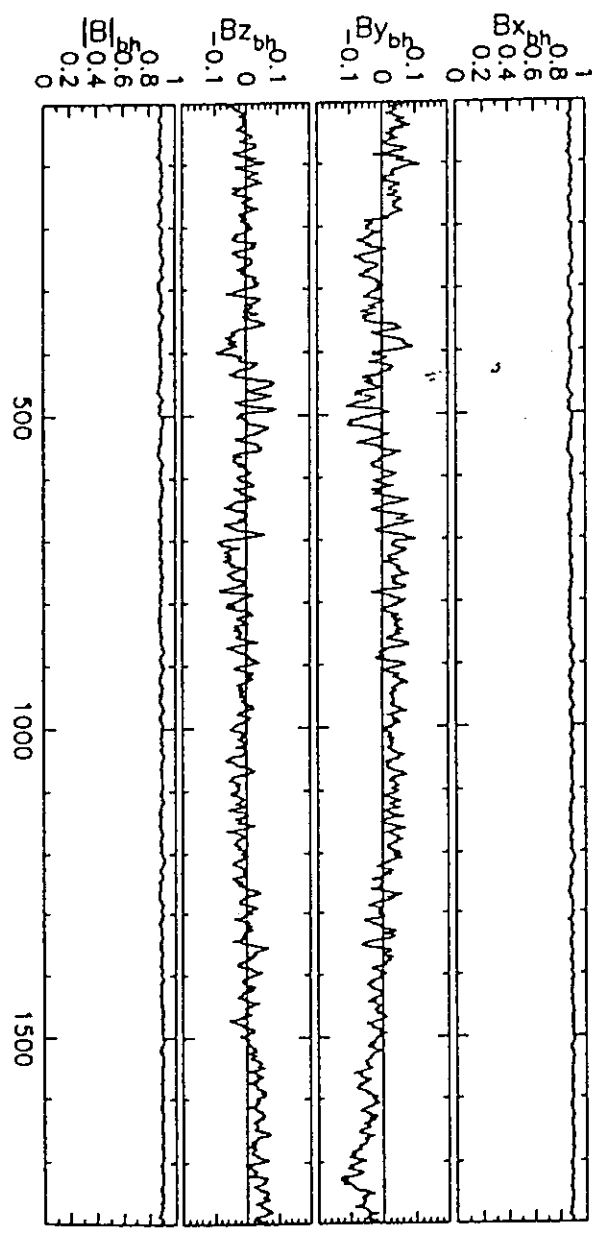
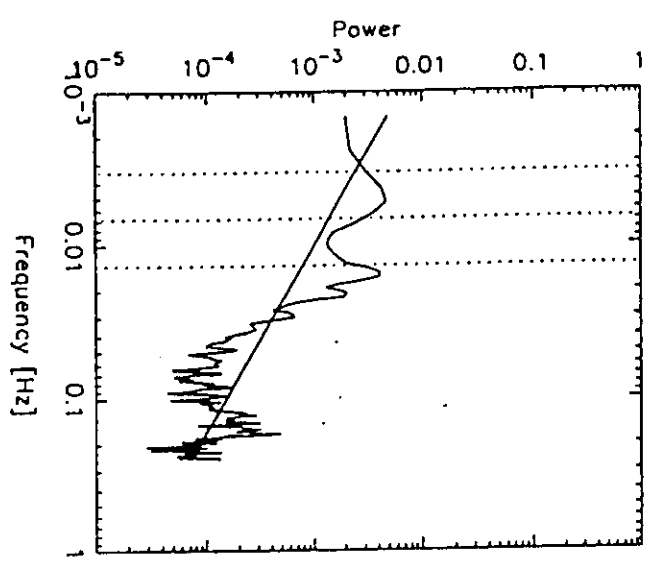
∴ the maximum ion speed = $2v_w$.



96 244 AUG 31 14:00:00.000 to 96 244 AUG 31 15:00:00.000 2.0 s



6 Spectra 512 Points in FFT, Smoothed 3 pts in freq
 $B_{sh} = (0.84, 0.15, 0.26)$ $\sigma_{B_{sh}} = (0.01, 0.04, 0.03)$



↓ ↑ R A X

