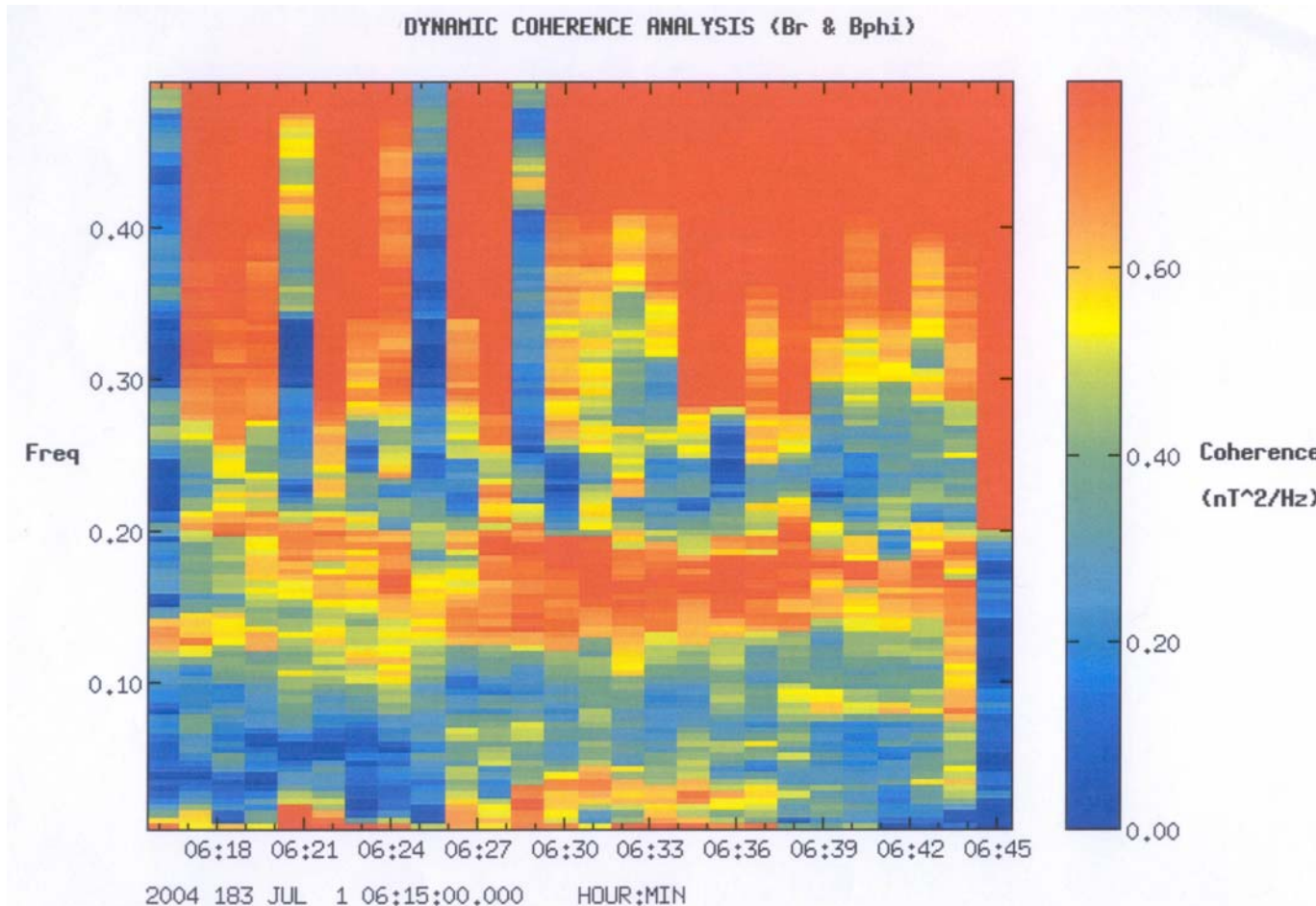


ESS 265 Problem Set on Dynamic Spectra and Wave Analysis

C.T. Russell

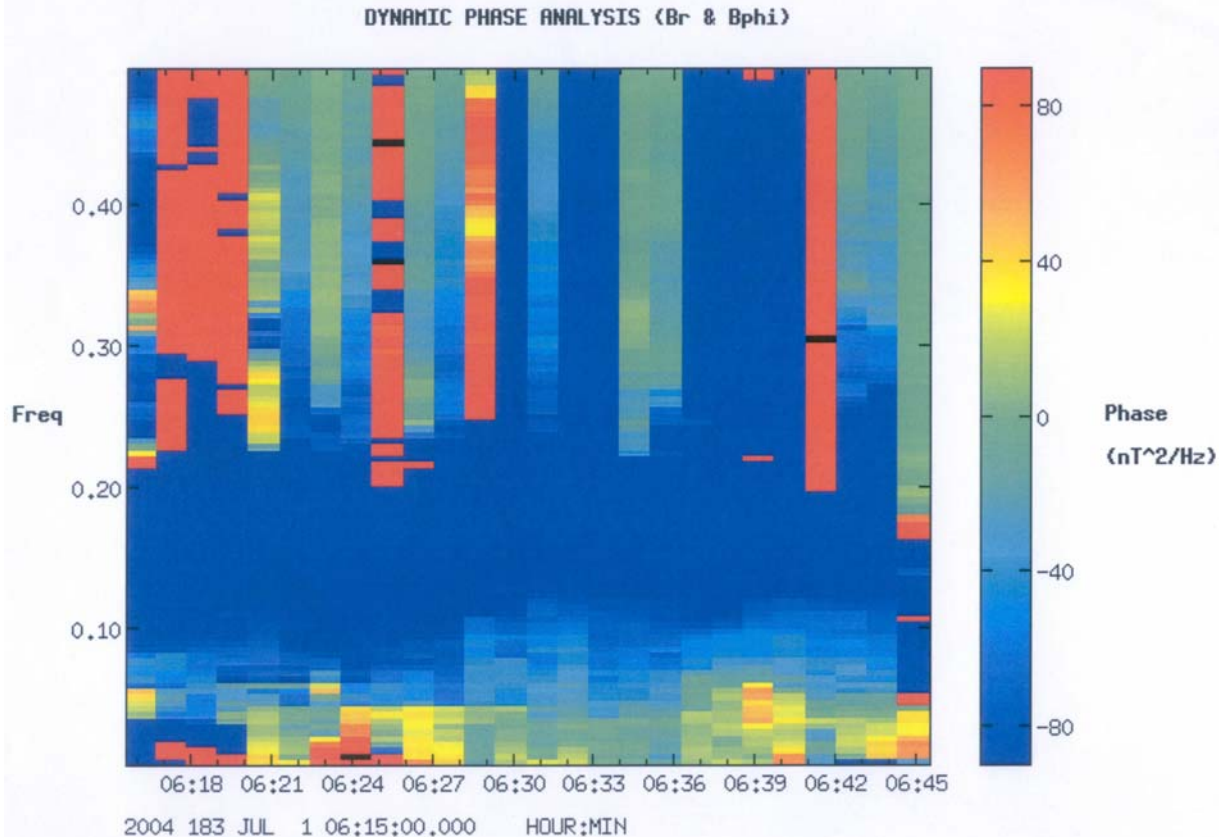
May 28, 2008

Dynamic Coherence



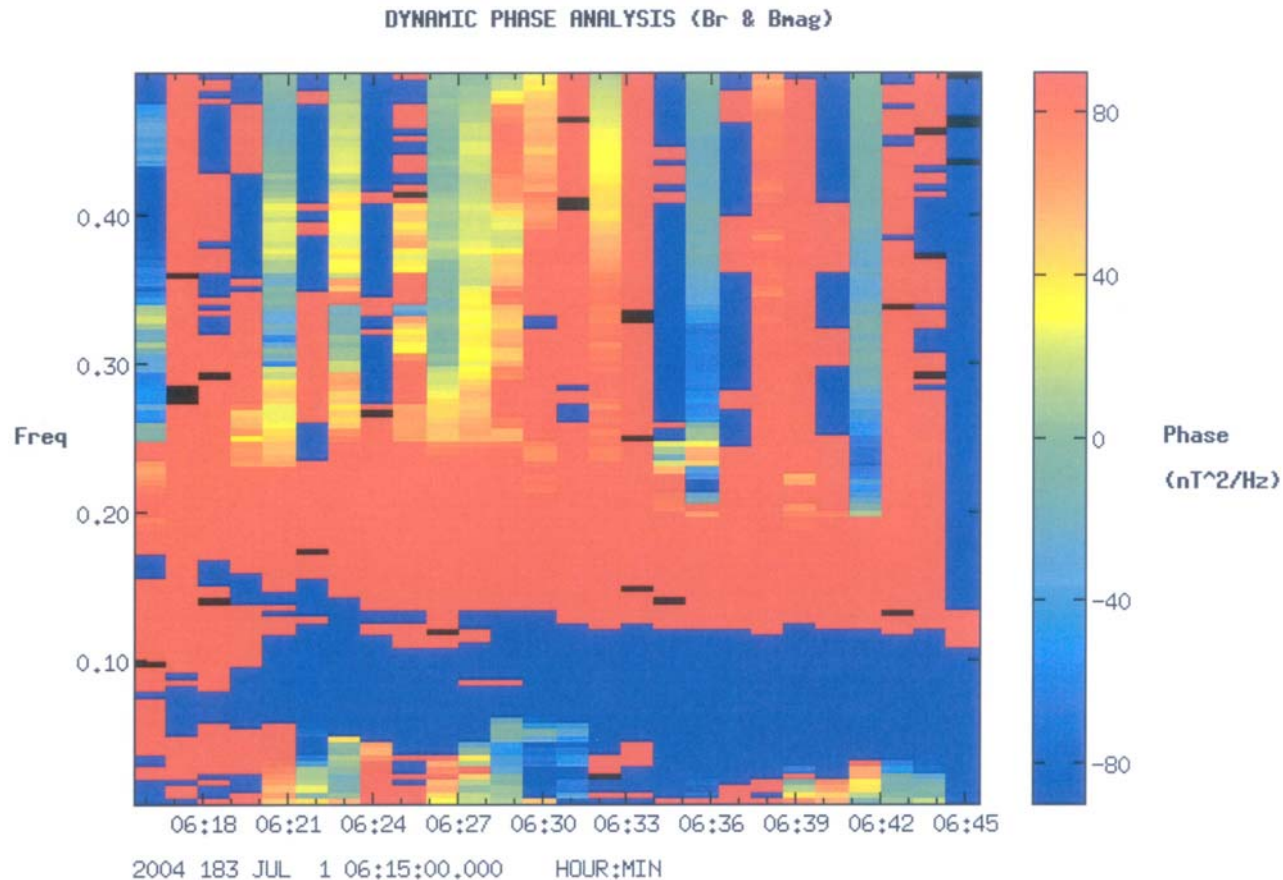
- The coherence between B_r and B_{phi} shows a strong single source of transverse waves from about 0.13 to 0.21 Hz.

Dynamic Phase Analysis 1



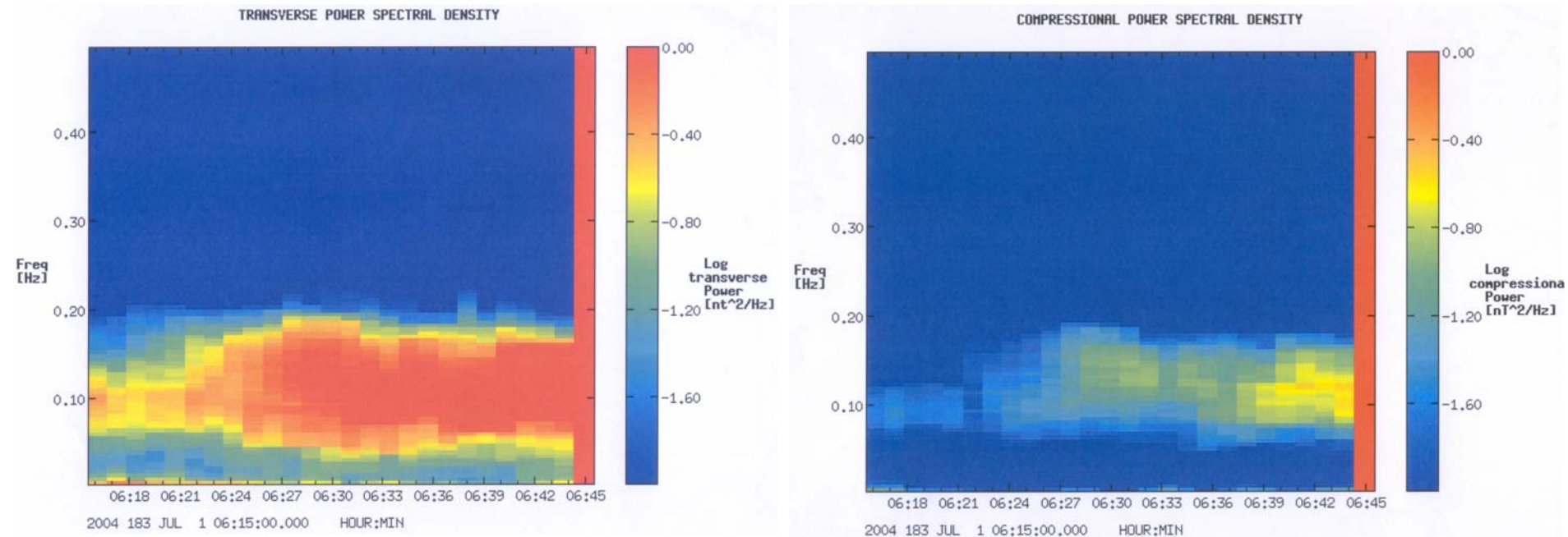
- The dynamic phase analysis shows that there are left-handed polarized waves over an even larger region of frequency. Perhaps the lack of coherence is due to two or more incoherent sources at lower frequencies: O_2 , N_2 , CO , CO_2 ?

Dynamic Phase Analysis 2



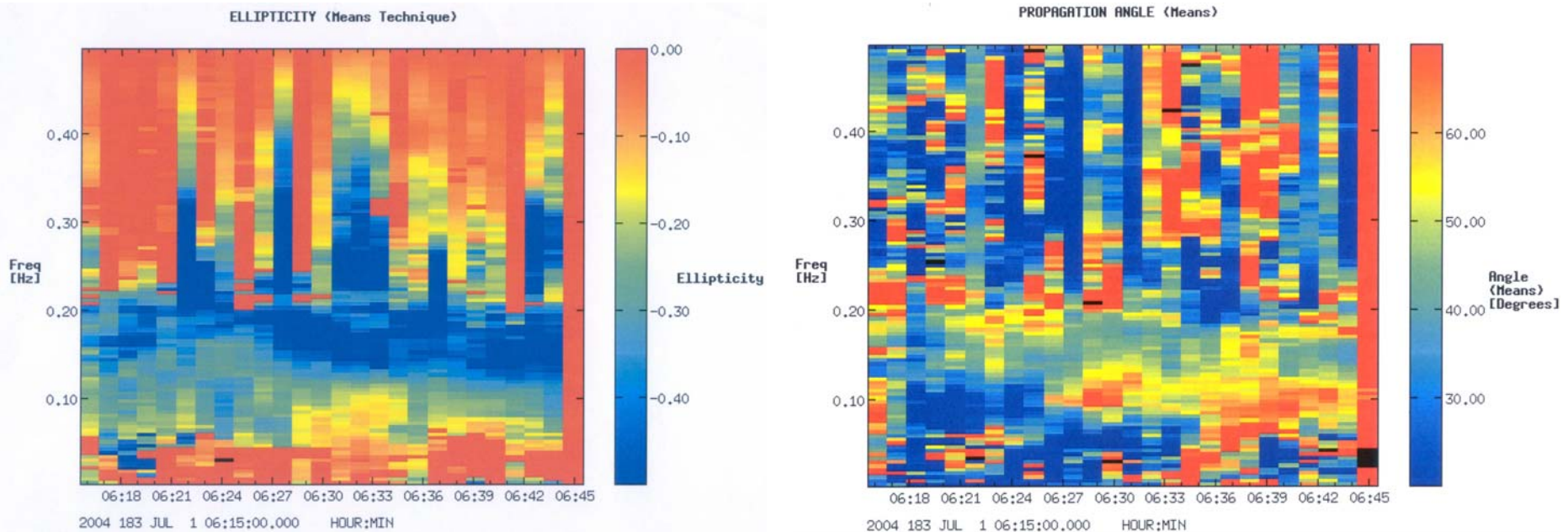
- The sudden change in the correlation between the B_r component of the wave and the compressional component is both striking and surprising.
- Perhaps this is a cross-over or cut-off frequency of the multi-component plasma, but the waves are left-handed on both sides of the transition.

Wave Analysis 1



- The waves begin at 0.10 Hz and then a broader spectrum of waves arise. This may have been because there were more of the heavier unstable species or because the heavier species had more mass and have free energy.
- The waves have very little compressional power.

Wave Analysis 2



- The higher frequency waves are more circularly polarized than the lower frequencies.
- The propagation direction at first is farther from the field line for the higher frequencies. Later, the lower frequencies appear to propagate at the greater angle to the field.