

COHERENCE OF CHARGED PARTICLE OSCILLATIONS IN THE HELIOSPHERE ($f \sim 5 \mu\text{Hz}$): IMPLICATIONS FOR A SOLAR MODULATION SOURCE

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Time series analysis of low energy electron and high energy proton cosmic ray fluxes, both measured on the Ulysses spacecraft, shows that they are quite coherent in some frequency bands in the energy range 0–6 μHz , especially near 5 μHz . That is, interplanetary particle fluxes with vastly different kinematic properties (e.g., gyrofrequencies) are modulated coherently in the heliosphere at discrete frequencies; one specific example, discussed here, has a period of ~ 2.2 days. The analyzed data spans the interval Jan. 1, 1993 to April 20, 1994 when Ulysses traveled between 22° and 60° south heliographic latitude and was about 4 AU from the Sun. Frequencies with high coherence appear to be associated with solar rotation and with discrete solar modal frequencies. The mode at 5.26 μHz is tentatively identified as a zonal harmonic with $l = 2$, $m = 0$.