

APPLICATIONS OF ULF WAVES AS DIAGNOSTICS OF THE MAGNETOSPHERE AND EFFECTS IN THE IONOSPHERE

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The magnetised plasma of near-Earth space supports ultra-low frequency perturbations that range in frequency from mHz to Hz. This spectrum is not flat. The mHz frequencies have longer wavelengths which are of order the size of the magnetosphere. Therefore, ULF perturbations encode magnetosphere properties and dynamics. ULF wave research is a relatively recent research field yet significant progress has been made in unraveling the magnetosphere information provided by recorded ULF wave signatures. Magnetometers of various designs have provided most of the data and have been flown on spacecraft and arranged in ground based arrays. However, Doppler sounders, radars, optical measurements and even GPS signals can be used provided the ULF signature in these data can be identified and the mechanisms understood. This presentation will highlight the use of ULF waves in remote sensing the magnetosphere and focus on expanding their application to technologies that rely on understanding large scale ionosphere dynamics. These include GPS, radio astronomy and over-the-horizon radar systems.

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