

# **COMPARISON THE HYPERFINE STRUCTURE OF WHISTLERS MEASURED SIMULTANEOUSLY ON GROUND STATION AND ON BOARD OF DEMETER SATELLITE**

D. HAMAR 1, Cs. Ferencz 1, P. Steinbach 2, J. Lichtenberger 1, O. E. Ferencz 1  
and M. Parrot 3

1 Space Research Group, Dept. of Geophysics and Space Sciences, Eötvös University, H1117 Budapest, Pázmány Péter sétány 1/A., Hungary, email: dani@sas.elte.hu

2 MTA-ELTE Research Group for Geol., Geophys. and Space Sci., HAS, Budapest, Hungary, email: steinb@sas.elte.hu

3 LPCE-CNRS Orleans, France, email: [mparrot@cnrs-orleans.fr](mailto:mparrot@cnrs-orleans.fr)

An effective mathematical method based on matched filtering (MF) has been developed earlier to analyze the frequency-time-amplitude pattern of whistlers. The accuracy and the separation of the closely spaced traces can be further increased with least square estimation of the parameters of the filter output. The obtained “hyperfine” structure can not be seen in usual spectrograms and can be explained by the excitation and the propagation.

The method has been applied to whistlers measured simultaneously at ground station (Tihany, Hungary) and on LEO orbiting satellite (DEMETER) during nearby passes. The comparison of the obtained “hyperfine” structures enables us to examine the mechanism and effect of the coupling of the electromagnetic signals from the lower ionosphere into the Earth-ionosphere-waveguide. The remarkable difference between the matching traces in the satellite and the ground data can be explained by the process of wave energy leaking out from the ionized medium into the Earth-ionosphere waveguide but needs further investigations.

Whistler, finestructure, coupling

Dániel Hamar Eötvös University, Department of Geophysics and Space Sciences, Budapest, Hungary, dani@sas.elte.hu