



Fine structures and waves manifestation inside main ionospheric trough

H. Rothkaehl (1), P. Koperski (1), M. Grzesiak (1), A. Krankowski (2), and A. Kułak (3)

(1) Space Research Centre Polish Academy of Sciences, Warsaw, Poland (hrot@cbk.waw.pl, 0048228403131), (2) Institute of Geodesy, University of Warmia and Mazury in Olsztyn, Poland, (3) Astronomical Observatory of Jagiellonian University, Cracow, Poland

The mid-latitude electron density trough observed in the topside ionosphere has been shown to be the near-Earth signature of the plasmopause and can provide useful information about the magnetosphere-ionosphere dynamics and morphology.

Thus for present the evolution of ionospheric trough in time and space domain we need some multipoint measurements and different type of measurements techniques. To develop a quantitative model of evolution ionospheric trough features during geomagnetic disturbances the analyse of waves and particle situ measurements on board of DEMETER satellite, ground-based ULF “Hylaty” station located in Bieszczady(Poland) mountains and TEC data was carried out.

The aim of this paper is to present some general behaviour of trough dynamics as well as the fine structures of ionospheric trough and discuss the different type of instability generated inside the trough region from ULF frequency range thru VLF up to HF frequency range. We would like to highlight the role of wave particle interaction inside the trough region. As a consequence of different time scales of physical processes occurred in the near Earth environment during geomagnetic disturbances we discusses the different fine structures of main ionospheric trough both in particle as well as in waves presentation.