



Modulation of TEC/GPS by ULF Pc5 waves

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The intriguing effect was found while analyzing the small-scale variations of total electron content (TEC) derived from global positioning system (GPS) signals. We have searched for a possible response in TEC variations to intense global Pc5 pulsations with period about few mHz during the recovery phase of the strong magnetic storm on Oct. 31, 2003. Earlier studies demonstrated that the GPS-TEC technique is a very powerful method to study the propagation pattern of transient disturbances in the ionosphere, generated by seismic or internal gravity waves. This technique has turned out to be unexpectedly sensitive to ULF waves as well. During periods with intense Pc5 geomagnetic wave activity very clear pulsations with the same periodicity were found in the TEC data from high-latitude GPS receiving stations in Scandinavia and Arctic Canada. Moreover, the relative amplitude of TEC periodic fluctuations was about an order of magnitude larger than relative amplitude of geomagnetic variations. So far, the effect of TEC modulation by Pc5 waves is not well understood and is still a challenge for the MHD wave theory.