



Wave-like structures in upper thermosphere from CHAMP accelerometer measurements

— Case study of the Nov. 2003 super-storm

Zhou Y. L. (1) , Ma S. Y. (1) , Luehr H. (2) , Liu R. S. (1)

(1) Lab of Geospace Environment and Geodesy, College of Electronic Information, Wuhan University, P. R. China 430079, (2) GeoForschungsZentrum, Potsdam, Germany 14473

With the measurements of the accelerometer on board CHAMP during the super geomagnetic storm occurring on November 20-21, 2003, the wave-like structures in upper thermosphere are investigated. It is found that the wave-like structures which are manifested in mass density firstly appear at higher latitudes during the initial phase of the storm, subsequently emerge at all latitudes during the main phase of the storm, and finally occur only at higher latitudes again during the recovery phase of the storm. The magnitude of the wave-like structures is much larger on the dayside during the main phase than on the night-side and the other storm phases. By Maximum entropy method we estimated the horizontal wavelength of the wave-like disturbances. It is indicated that the wave-like disturbances usually have longer horizontal wavelength at lower latitudes than at higher latitudes. Combined with the PLP data of electron density observed by CHAMP, the relationship of the wave-like structures in thermosphere density and the Traveling Ionospheric Disturbances (TID) is also considered.