

## **A new empirical model of the thermospheric mass density obtained from the CHAMP satellite**

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It has been reported that the dayside thermospheric mass density at about 400km altitude has two maxima at both sides of magnetic equator similar to electron density [H.Liu et al, 2005]. The particular density structure in magnetic equatorial regions shows that an interaction between neutral particles and plasma plays some role in the thermospheric dynamics. But physical mechanism of the particular density structure has not been understood well. And one of well-known empirical model MSIS (Mass Spectrometer and Incoherent Scatter) can't reproduce the particular density structure.

We have constructed a new empirical model at about 415km altitude regions by analysing data obtained from the CHAMP satellite. We confirmed that the new empirical model can reproduce the particular density structure. And we found that the altitude where the particular structure was observed well varied with the season and that points where density got to maxima depended on the season. Also we confirmed that mass density distribution depended on geographical longitude strongly.

In this presentation, we will discuss about the dependences of the thermospheric density structure on altitude, season, solar activity, geomagnetic activity and geographical longitude, and the accuracy of the new empirical model.