Japan Geoscience Union Meeting 2011
(May 22-27 2011 at Makuhari, Chiba, Japan)

PEM032-P12 Room:Convention Hall Time:May 27 10:30-13:00

The dependence of latitude of period of small magnetic variation in the middle and lower latitude over the ionosphere fr

Kunihito Nakanishi[1*], Toshihiko Iyemori[2]

[1]SPEL, KYOTO UNIV, [2]WDC for Geomagnetism, Kyoto Univ

As the result of the analysis of magnetic field observed by Oersted satellite to measure the Earth's magnetic field accurately at the low altitude(600 km - 900 km) from 1999 to 2002, the existence for nearly all the time of magnetic variation with period shorter than 30 seconds has been reported. We can, as to variation in the region between the middle and lower latitude, see the phenomenon a lot that the period becomes longer with the decrease of latitude. This phenomenon is also shown by magnetic field observed by CHAMP satellite to measure the Earth's magnetic field accurately at the low altitude(300 km - 450 km) from 2000. The calculation of power spectra with respect to period of this variation using the Maximum Entropy Method shows the above characteristic property. This property is reverse to that of geomagnetic pulsation that the period of it, in general, becomes shorter with the decrease of latitude, that is, this can be thought to be beyond description of the magnetic variation. It may, with the assumption that this phenomenon is of Nature, be attributed to the effect of the lower atmosphere. It follows from this theory that the wave arising in the lower atmosphere propagates to the upper to cause dynamo in the ionosphere, accompanied by the magnetic variation that is observed by both the satellites. Following this mechanism, the supposition that the spatial scale in the ionosphere is homogeneous, or, is dependent of the latitude will, because of the increase of the interval of latitude between lines of magnetic force with the increase of latitude, lead to the fact that the spatial scale should become bigger in the upper layer of the ionosphere where the satellite flied, that is, the period should become longer. This time we will, in comparison with Oersted data and CHAMP data, report the result of whether or not the above model is valid, with the dependence of the period of the observational small magnetic variation with respect to the region, the local time, the season respectively.

Keywords: ionosphere, small magnetic variation, CHAMP satellite, Oersted satellite