

## 大気圏 - 電離圏上下領域結合シミュレーション : 大気潮汐と電離圏変動との関係

# 陣 英克 [1]; 三好 勉信 [2]; 藤原 均 [3]; 品川 裕之 [4]; 石井 守 [5]; 大塚 雄一 [6]; 齊藤 昭則 [7]

[1] 情通研; [2] 九大 理 地球惑星; [3] 東北大・理・地球物理; [4] NICT; [5] 情報通信研究機構; [6] 名大 STE 研; [7] 京大・理・地球物理

### Development of a whole atmosphere-ionosphere coupling model: effects of atmospheric tides on ionospheric day-to-day variability

# Hidekatsu Jin[1]; Yasunobu Miyoshi[2]; Hitoshi Fujiwara[3]; Hiroyuki Shinagawa[4]; Mamoru Ishii[5]; Yuichi Otsuka[6]; Akinori Saito[7]

[1] NICT; [2] Earth and Planetary Sci, Kyushu Univ.; [3] Dept. of Geophysics, Tohoku Univ.; [4] NICT; [5] NICT; [6] STELAB, Nagoya Univ.; [7] Dept. of Geophysics, Kyoto Univ.

Recent atmospheric and/or ionospheric observations have increased the importance of understanding the vertical coupling processes between the atmosphere and the ionosphere. Even during geomagnetically quiet periods, day-to-day variability of ionospheric phenomena, such as the development of EIA (equatorial ionospheric anomaly) and the occurrence of plasma bubble, were observed by ground-based optical imagers, radars, and GPS receivers. Their seasonal and longitudinal dependences were also observed by spacecraft instruments. Such variations in the ionospheric phenomena are believed to be affected by atmospheric variations through the atmospheric dynamo process. In fact, there have been some observations in recent years, which suggest a close relationship between the atmospheric waves originated in the lower atmosphere and the ionospheric variations. In storm time, moreover, atmosphere-ionosphere interactions are considered to play an important role in causing the observed ionospheric/atmospheric disturbances; behaviors of TID/TAD, effects of change in the atmospheric composition and neutral wind circulation, and so on. These observations have made the role played by numerical model which couples the atmosphere and the ionosphere more important.

Development of regional coupling models has been very active in oversea. In Japan, the troposphere-stratosphere-mesosphere-thermosphere GCM has been developed in Kyushu University and Tohoku University, and the thermosphere-ionosphere model developed in NICT, independently. In this project, we develop global coupling model between the atmospheric regions and the ionosphere by coupling the two models and adding the atmospheric dynamo process. In this presentation, we will report some initial results including effects of atmospheric tides on the ionospheric day-to-day variation.

近年、電離圏/大気圏の観測とその解釈がなされるにつれて、大気圏と電離圏の上下領域をつなぐ数値モデルの重要性がより一層高まっている。例えば、対流圏で励起される波動と、電離圏現象（赤道異常の発達やプラズマバブルの発生）の日々変動との関係を示唆する観測が、近年数多く報告されている。また、広域多種の観測により、ストーム時における電離大気 - 中性大気の複雑な相互作用の様相が明らかにされている。こうした背景の下、領域結合モデルの開発が世界で盛んに行われている。我々も対流圏 - 成層圏 - 中間圏 - 熱圏 GCM（九州大、東北大）と熱圏 - 電離圏（NICT）を結合し、さらに両者を電磁氣的つなぐダイナモモデルを加え、大気圏 - 電離圏上下結合モデルを開発中である。前回の発表では計画の概要を示した。今回は結合モデル開発の途中報告を行う。特に、大気潮汐の電離圏への影響について初期結果を発表する。