

成層圏昇温の電離圏への影響：大気圏 - 電離圏結合モデルと観測との比較

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Effects of stratospheric sudden warming on the ionosphere: comparisons between GAIA model and observations

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Recent observations and simulations have shown that temporal and spatial variations in the upper atmosphere are affected by lower atmosphere more than considered so far and that atmospheric waves play an important role in the vertical connections. However, it is not much known how largely the variabilities in the upper atmosphere observed on various spatial and temporal scales can be attributed to the waves from lower atmosphere, and their relation to specific meteorological activities. In order to address these issues, we have developed a whole atmosphere-ionosphere coupled model, named GAIA (Ground-to-topside model of Atmosphere and Ionosphere for Aeronomy). Initial model results have showed that some longitudinal and latitudinal variations as recently observed are generated through atmospheric vertical coupling and thermosphere-ionosphere interactions.

As a recent progress, we introduced meteorological reanalysis data into the simulation, in order to reproduce realistic upper atmospheric variations. We will compare the simulation results with ionospheric observations (global TEC and COSMIC measurement), especially focusing on the ionospheric variations during the major stratospheric sudden warming event on January-February 2009, and discuss how the stratospheric warming lead to the observed ionospheric observations.