

全大気結合モデル GAIA で得られた熱圏重力波のふるまいについて

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Gravity Waves in the Thermosphere Simulated by a whole atmosphere-ionosphere model (GAIA)

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It has been recently recognized that gravity waves play an important role in determining the momentum and energy balance in the thermosphere. In this study, the effects of upward propagating gravity wave on the general circulation in the thermosphere are investigated using a whole atmosphere-ionosphere coupled model called GAIA. The GAIA contains the region from the ground surface to the upper thermosphere (about 500km altitude), so that the excitation of gravity waves in the lower atmosphere and their upward propagation of gravity waves from the lower atmosphere to the thermosphere are resolved implicitly. The high horizontal resolution of the neutral atmospheric part of GAIA is about 1.0 degree longitude by 1.0 degree latitude, and this model can simulate large scale gravity waves in their thermosphere. Our simulation results indicate that gravity wave activity in the thermosphere has significant temporal and latitudinal variations. In this study, we focus on gravity wave activity in the winter thermosphere. Some of gravity waves in the winter thermosphere is secondary gravity waves generated near the polar night jet in the stratosphere and mesosphere. Moreover, seasonal variations of thermospheric gravity waves are also examined. The impact of the thermospheric gravity wave on variability in the ionosphere are investigated.