Nonmigrating tidal effects on the equatorial ionization anomaly studied with a whole atmosphere-ionosphere coupling model

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Recent atmospheric and/or ionospheric observations have increased the importance of understanding the vertical coupling processes between the lower atmosphere and the ionosphere. One of such discoveries is the four-peaked longitudinal structure of equatorial ionization anomaly first observed by IMAGE, which is considered to be effects of upward propagating nonmigrating tides generated by latent heat release in the troposphere. The atmospheric tidal effects can happen through the electrodynamics in the ionospheric E and F regions, and through the ion-neutral collisional drag along geomagnetic field line.

In order to study the atmosphere-ionosphere coupling processes, we are trying to couple several regional models. They include a whole atmosphere global circulation model that covers from the earth surface to the exobase, a global thermosphere-ionosphere model, and an electrodynamics model. In this presentation, we will report simulation results with respect to the nonmigrating tidal effects on equatorial ionospheric anomaly, using the whole atmosphere-ionosphere coupling model.