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## Study on latitudinal variation of the thermospheric mass density and zonal wind

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Recent observational studies have revealed that the latitudinal distributions of the mass density and zonal wind at low latitudes in the thermosphere are strongly influenced by the ionosphere. In particular, the mass density trough during daytime and the fast eastward jet during evening are located along the dip equator. However, physical mechanisms of these equatorial anomalies of the neutral atmosphere are not well known. In this study, using an atmosphere-ionosphere coupled model (GAIA), we investigate generation mechanism of the latitudinal distributions of the mass density and zonal wind at low latitudes. The GAIA solves the ionosphere-thermosphere interaction self-consistently, including the electrodynamics, so that we can discuss the generation mechanism quantitatively. In order to investigate the generation mechanism of the mass density trough along the dip equator, the latitudinal distributions of the temperature and the atmospheric constituent, such as atmospheric oxygen, are studied in detail. As for the eastward jet formation, effects of the ion drag, pressure gradient force, advection term, Coriolis term on the momentum balance of the zonal wind are examined.

Keywords: thermospheric structure, numerical simulation, coupled model