

トロムソ観測点のファブリ・ペロー干渉計を用いた地磁気静穏時における高緯度熱圏平均風の研究

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Study of high-latitude quiet-time mean thermospheric winds with a Fabry-Perot interferometer in Tromsøe, Norway

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In the previous study, we have studied thermospheric wind variations at the onsets of isolated substorms by using a Fabry-Perot interferometer (FPI) in Tromsøe Norway. In this research, we investigated nightside mean thermospheric winds during periods of geomagnetically quiet condition. The wind variations were measured from the Doppler shift of both red line (630.0 nm, altitudes: 200-300 km) and green line (557.7 nm, altitudes: 90-100 km) emissions with a time resolution of ~13 min for deriving each wind vector. We used the X-component of local magnetometer data and Kp index to indicate the locally and globally quiet conditions, respectively. At first, we found that the wind pattern in Tromsøe can be affected by the geomagnetic activity even under quiet conditions (Kp < 1+ and the variation of X-component is less than 50 nT from 3 hours before the wind observation) when considering the typical tidal structures. We discussed these quiet-time results with our previous event study regarding effects of the substorm onset. We also investigated the dependence of quiet-time winds on various parameters, for example, the geomagnetic activity level, solar radiation, and interplanetary magnetic field conditions. At F-region height, we found that the quiet-time winds at duskside are more sensitive to the geomagnetic activity level than those at dawnside. With greater 10.7 cm solar radio flux (F10.7), the eastward wind changed its direction to the west in the post-midnight sector, while the northward wind shows a larger amplitude at the pre-midnight sector.