

## Variations of scale height at F-region peak based on ionosonde measurements during solar maximum over the EIA region

## Variations of scale height at F-region peak based on ionosonde measurements during solar maximum over the EIA region

Yu-Jung Chuo<sup>1\*</sup>

Yu-Jung Chuo<sup>1\*</sup>

<sup>1</sup>Department of Information Technology, Ling Tung University

<sup>1</sup>Department of Information Technology, Ling Tung University

Scale height is an important parameter in characterizing the shape of the ionosphere and its physical processes. In this study, we attempt to examine and discuss the variation of scale height,  $H_m$  around the F-layer peak height during high solar activity at the northern crest of the equatorial ionization anomaly (EIA) region. The data analyzed in this investigation, including  $H_m$ , the bottomside profile parameter, the F2-layer maximum critical frequency, and its peak height are derived from ionograms recorded at Chung-Li ionosonde station (geographical coordinate 24.9°N, 121.1°E) in 1999.  $H_m$  exhibits a day-to-day and seasonal variation, with a greater average daily variation during daytime in summer. Furthermore, the diurnal variation of  $H_m$  exhibits an abnormal peak at pre-sunrise during all the seasons, particularly in winter. This increase is also observed in the F2-layer peak height for the same duration with an upward movement associated with thermospheric wind toward the equator; this upward movement increases the N2/O ratio and  $H_m$ , but it causes a decrease in the F2-layer maximum critical frequency during the pre-sunrise period. In addition, the results show a strong/weak correlation between the bottomside/equivalent slab thickness and  $H_m$  throughout the year. Furthermore, we present a comprehensive discussion of the physical processes regarding the variation of  $H_m$  during high solar activity periods.

キーワード: scale height, ionospheric physics, EIA, ionospheric dynamics

Keywords: scale height, ionospheric physics, EIA, ionospheric dynamics