

# The Variation of Ionospheric Slab Thickness over Equatorial Ionization Area Crest Region

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## Abstract

The GPS-derived total electron content (TEC) and NmF2 are measured at the Chung-Li ionosonde station (24.9°N, 121°E) in order to study the variations in slab thickness ( $\tau$ ) of the ionosphere at low latitudes ionosphere during 1996-1999, corresponding to half of the 23<sup>rd</sup> solar cycle. This study presents the diurnal, seasonal, and solar flux variations in  $\tau$  for different solar phases. The seasonal variations show that the average daily value is greater during summer and the reverse is true during equinox in the equatorial ionization anomaly (EIA) region. Moreover, the  $\tau$  values are greater during the daytime (0800-1600 LT) and nighttime (2000-0400 LT) for summer and winter, respectively. The diurnal variation shows two abnormal peaks that appear during the pre-sunrise and post-sunset hours. The peak values decrease as the sunspot number increases particularly for the pre-sunrise peak. Furthermore, the variation in the F-peak height (hpF2) indicates that a thermospheric wind toward the equator leads to an increase in hpF2 and an enhancement in  $\tau$  during the pre-sunrise period. Furthermore, the study shows the variations of  $\tau$  values for different geophysical conditions such as the geomagnetic storm and earthquake. A comprehensive discussion about the relation between  $\tau$  and the geophysical events is provided in the paper.