

[ATM-04] Behavior of the NmF2 and hmF2 over Anyang station (37.4N, 127.0E, Geomag = 27.7N, 196.9E)

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The peak density of the F2 layer of ionosphere (NmF2) and the height of the maximum density of the F2 layer (hmF2) have been used as key ionospheric parameters for GPS signal time delay correction. It is well known that the trends of the NmF2 and hmF2 variation are different with the region since the work of Torr et al. (1970). A comprehensive database of the NmF2 and hmF2 over the local area is thus needed to be analyzed, in order to develop an accurate ionospheric correction model for the local area GPS receiver. For the purpose of improving time delay correction models of GPS radio signals propagating through the ionosphere over Korean Peninsula, we study the ionospheric climatology using NmF2 and hmF2 data over south Korea by analyzing the ion density profile measured by the digisonde at the Anyang station (37.4N, 127.0E, Geomag = 27.7N, 196.9E) during the period of April 1998 through December 2008. Anyang digisonde data cover one complete solar cycle period with various solar activities and geomagnetic activity conditions. We sorted the data for the solar activities, geomagnetic activities, local times, and seasons to analyze the variation of the NmF2 and hmF2 for each condition. Local time variations of NmF2 and hmF2 were probed for each case of three (strong, medium, low) solar and geomagnetic activities, and each months. The NmF2 and hmF2 variations were compared with those derived from IRI-2007 model. In our results, the response of the noon time NmF2 to the solar flux indices (F10.7) is much higher in January than July and the hmF2 does not show seasonal dependences significantly, as reported by Bremer (2000). The NmF2 and hmF2 at Anyang vary little with geomagnetic activities, but the hmF2 data were higher by at least 50 km than the values of IRI-2007 for high solar activity in the moderate and high geomagnetic conditions. We classified the data in the cases of low, moderate and high solar activities for the low, moderate and high geomagnetic activities, 9 combined conditions. The semi-annual variations of NmF2 and hmF2 are dominant during daytime but not during nighttime. Annual anomaly of the NmF2 (higher in winter than summer) is clearly seen for 6 combined conditions. Semi-diurnal variations of the hmF2 were apparent for most seasons as reported by Oliver et al. (2008).