

Double Crests of Peak Height in the Equatorial Ionospheric F2 Layer Observed by COSMIC

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For the first time, we report daytime double crests of peak height (hmF2) in the F2 layer based on the COSMIC observations during 2007-2014. Evident double crests of hmF2 occurred at around $\pm 10^\circ$ geomagnetic latitude (MLAT) with a trough over the magnetic equator at low solar activity and at March equinox. This phenomenon is referred to as an Equatorial Height Anomaly (EHA) of the ionospheric F2 layer. The double crests became less obvious at September equinox and disappeared at solstices. At solstices only one crest was observed in the summer hemisphere, which is probably associated with trans-equatorial neutral winds. In addition, the double EHA crests generally take place during 10:00-14:00 local times. Our results indicate that the EHA favors the conditions of strong vertical plasma drifts and weak trans-equatorial neutral winds during low solar activity. The EHA feature is reproduced by the TIEGCM at March equinox and low solar activity.

Keywords: F2 layer peak height, Latitudinal variation, Equatorial anomaly, Ionospheric ceiling