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# Behaviors of the IRI-B parameters of the equatorial electron density profiles retrieved from FORMOSAT-3/COSMIC radio occultation measurements

L. Liu, W. Wan, M.-L. Zhang, and B. Ning

Inst. of Geology and Geophysics, Chinese Academy of Sciences, Beijing, China (liul@mail.iggcas.ac.cn)

The electron density profiles in the bottomside F2-layer ionosphere are described by the thickness parameter B0 and the shape parameter B1 in the International Reference Ionosphere model (IRI). We collected the ionospheric electron density (Ne) profiles from the FORMOSAT-3/COSMIC (F3/C) radio occultation measurements from DoY (day number of year) 194, 2006 to DoY 293, 2008 to investigate the daytime behaviors of IRI-B parameters (B0 and B1) in the equatorial regions. Our fittings confirm that the IRI bottomside profile function can well describe the averaged profiles in the bottomside ionosphere. Analysis of the equatorial electron density profile datasets provides unprecedented detail of the behaviors of B0 and B1 parameters in equatorial regions at low solar activity. The longitudinal averaged B1 has values comparable with IRI-2007 while it shows little seasonal variation. In contrast, the observed B0 presents semiannual variation with maxima in solstice months and minima in equinox months, which is not reproduced by IRI-2007. Moreover, there are complicated longitudinal variations of B0 with patterns varying with seasons. Four peaks are distinct in the well defined wave-like longitudinal structure of B0 in equinox months. An outstanding feature is that a stable peak appears around 100° E in four seasons. The significant longitudinal variation of B0 provides challenges for further improving the presentations of the bottomside ionosphere in IRI.

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