

Ionospheric Space Weather Data Product of FORMOSAT-7/COSMIC-2

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FORMOSAT-7/COSMIC-2 (F7/C2) will provide unprecedented number of ionosphere observations in the mid- and low-latitude regions where the ionosphere is highly variable due to its interactions with planetary waves, solar oscillations, and lunar tides overlapping on top of the original ionospheric climatological electron density morphologies. To study the strong day-to-day variability of the ionosphere there, we have developed a global ionospheric data assimilation model using radio occultation observations together with auxiliary observations from ground-based GNSS stations. The assimilation system is capable of producing day-to-day and hour-to-hour ionospheric electron density maps three dimensionally for the study. With the advance given by the newly developed data assimilation model, we re-examine the wave-4 variations on daily basis, as well as the migrating tidal variations during the stratospheric sudden warming events. Additionally, electron density profiles from the aided Abel inversion of radio occultation observations will also be provided which is expected to give more reliable electron density profile around 200-300 km altitude compared with traditional Abel inversion. The abovementioned ionosphere products from the F7/C2 observations will be available six months after launch.

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