



Global S4 Index Maximum Probed by FORMOSAT-3 /COSMIC

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This paper reports 3D structure and dynamics of the ionospheric scintillation in terms of the maximum value of the S4 index (S4max) probed by radio occultation FORMOSAT-3/COSMIC (F3/C) satellites during 2007-2013. The S4 index is calculated from fluctuations of the signal-to-noise ratio (SNR) intensity in the L1 channel of GPS radio occultation signals recorded by F3/C GOX (Gps Occultation eXperiment). On average, nearly 6000 to 7000 S4 index profiles are derived by F3/C per day covering an altitude range from the Earth's surface to 800 km. The diurnal, seasonal, solar activity, and geographical variations of 3D S4max are examined. An integral process is introduced converting the satellite-based S4max to ground-based one which will be further used to estimate the worst case of GPS scintillation on the ground during both low and high solar activities.