

Scintillation during low solar activity periods (2009-2010) near the equatorial ionospheric crest region in Indonesia

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Strong scintillations over Bandung (6.5S, 107.3E, geomagnetic latitude is 16.5S) near the equatorial ionization anomaly crest in Indonesia was examined to study the ionospheric variability during low solar activity periods. Equatorial scintillation happens when small-scale irregularities in the F region of the ionosphere affect the radio-frequency signals. Influenced by the pressure gradients and gravity, the equatorial plasma present in the F2 layers is forced downward along the magnetic field lines. Scintillation activity can be indicated by S4 index. Strong scintillation is generally considered to occur when S4 index is greater than 0.5 and less than equals 1 and is associated with strong scattering of the signal in the ionosphere. Data was obtained from "GPS Ionospheric Scintillation and TEC Monitor" (GISTM) GSV4004B in Bandung from January 2009 until December 2010. Considering sunspot number and Solar radio flux 10.7 as the measure of solar activity, daily SSN and solar radio flux are presented. Solar activity in 2010 is higher than in 2009. The amount of data S4-index during the night had calculated its occurrence of strong scintillation. Results showed the occurrence of scintillations more frequently occurs in March-April and September-October. The maximum number of occurrence of strong scintillation is 13 on April 10 and is 34 on October 2, while in 2010; the maximum number of occurrence of strong scintillation is 101 on March 13 and is 42 on September 22. Occurrence of ionospheric scintillation in 2010 was higher than in 2009. It shows that scintillation is related to solar activity. The plotting of S4 index per-satellite with a sample of satellite PRN 16, PRN 20 and PRN 31 in 2010 (March 13, March 23, March 24) has established. In general, scintillation was started at 13:00 UTC (=20:00 LT) and lasted for about 10 minutes to 2 hours.