

Inter-hourly variability of total electron content during the quiet condition over Nigeria, within the equatorial ionization anomaly region

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Abstract : The inter-hourly variability (IHV) of the Total Electron Content (TEC) over Nigeria during the quiet days ($A_p < 4$) of the year 2013 was examined using ground-based GPS receivers installed at seven (7) different locations across Nigeria by the Nigerian Global Navigation Satellite Systems (GNSS) Reference Network (NIGNET) operated by the office of the surveyor general of Nigeria. Nigeria is a country that lies within equatorial ionospheric anomaly (EIA) region. The IHV was calculated by converting the observed hourly slant TEC (STEC) value into the hourly vertical TEC (VTEC) and the differencing (ΔTEC) with its corresponding hourly value from the previous day. There is a clear variation which depicts the expected temporal variability. The IHV in TEC in all the stations ranges between 0-20 TECU (TEC Units). The seasonal variation of the IHV of TEC over Nigeria maximizes (5-20 TECU) during Equinoctial months and minimizes (1-10 TECU) during the Solstice months. The IHV of TEC in September equinox period is higher than that of March equinox. Minimum value of IHV (~ 7 TECU at equinoxes and ~ 5 TECU at Solstice) was recorded at the Office of Surveyor General of the Federation (OSGF) station and the maximum value (~ 12 TECU at equinoxes and ~ 16 TECU at Solstice) was recorded at the Birni Kebbi Federal Polytechnic (BKFP) station which may be due to the fact that BKFP at 0.72° dip latitude is closer to the dip equator.