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COMPARISON OF TRANSIENT VARIATION OF TOTAL ELECTRON CONTENT WITHIN AND OUTSIDE EQUATORIAL IONIZATION ANOMALY REGION

Abstract

TEC data from ground GPS stations at Federal University of Technology Akure in Nigeria (an EIA region station) and Matera in Italy (a middle latitude region station) from 2008 to 2010 were used. Daily diurnal variation of TEC, shows that there exist a predawn minimum value of TEC between 0300 LT and 0600 LT in both the EIA region (sometime as low as 0.6 TECU) and middle latitude region (2.1 TECU), as well as pre-midnight enhancement (as high as 16.1 TECU at EIA region and 11.4 TECU at middle latitude region). TEC was also observed to usually peak at local noon in the EIA region, while TEC in the middle latitude region peaks when it is most enhanced; which often occur in the noon and post noon sector of the local time. The monthly variation shows that Equinox month (March, April, September and October) usually has highest TEC. The study shows that equatorial ionization enhances TEC, and that TEC in the EIA region is mainly controlled by the EIA development, while the TEC variation in the middle latitude region is controlled by extreme ultraviolet solar radiation and neutral winds.