A Study of the Equatorial Ionosphere Over Nairobi during Selected Magnetically Disturbed and Quiet Times for the Year 2009 Using Co-Located Instruments.

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Abstract

Investigation of the behavior of the Equatorial Ionosphere over Nairobi-Kenya within the East Africa region is done using co-located instruments, that is, SCINDA-GPS system and a Magnetometer (MAGDAS). This was done for magnetically disturbed days, 22 and 23 July, 2009, as well as for quiet days before and after the geomagnetic disturbances. TEC depletions were observed and amplitude Scintillation indices plots were made and an attempt made to correlate these with modelled surface electric fields computed from magnetic field variations. The results show that most geoelectric field enhancements occurred between 0700 LT and 1300 LT mostly in the east-west component and in the post-midnight local time while scintillations and TEC enhancements and depletions occurred mostly between 0900 LT and 1100 LT during geomagnetic disturbances and between 1300 LT and 1400 LT during quiet times. This may be attributed to the development of the Equatorial Ionization Anomaly or an extension of the neutral wind dynamo driven by the E-region neutral wind and gravity waves generated by convection. Moreover, geoelectric field enhancements were accompanied by scintillations and TEC enhancements or depletions since pre-reversal enhancement in **EXB** drift controls the occurrence of scintillations.

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