AOGS 2006

Seasonal Variation Characterestics of Radio Refractive Index Over Sub-Tropical Humid Environment

SUKLA DUTTAGUPTA[1], TUKTUKI R. GHOSH[1]

[1] *Calcutta University, T. R. Institute of Radio Physics & Electronics*
92, Acharya Prafulla Chandra Road, Kolkata-700009, India

In radio wave propagation, the radio refractive index along with its gradient is predominantly responsible for defocusing the line-of-sight radio waves below 10 GHz. Therefore measurement and mapping of the refractive index at various height levels of the troposphere is important in obtaining their statistical distribution and getting information involving the defocusing of the radio signal. In the present paper a detailed analysis of various meteorological data is made to obtain the day to day prevailing radio refractivity over Kolkata (lat 220 N; long 880 E) at surface and at elevated regions. A statistical analysis is carried out and it shows a distinct seasonal pattern in refractivity profile. Then a thorough review of refractivity along with its gradient is grouped for each season twice daily at various heights from the surface to 10 km. A model is developed correlating the various meteorological parameters in determining the gradient of refractivity in different seasons over this region. Using case studies of several interesting observations the resultant impact on varied atmospheric situations are also focussed.