THE INVESTIGATION OF THE VERTICAL SURFACE RADIO REFRACTIVITY GRADIENT IN AWKA, SOUTH EASTERN NIGERIA

Okeke C. Chukwunike[1*] & Ikeh U. Chinelo[1]
[1]Nnamdi Azikiwe University, Awka, Anambra State, **NIGERIA**

ABSTRACT

In the designing and planning of terrestrial radio links in the lower atmosphere for communications, surface radio refractivity gradients are very important for observing propagation conditions. In this work, we made use of mean data collected from meteorological variables (temperature, pressure and relative humidity) for two-year period of 2013 and 2014.Davis Weather Station equipped with Integrated Sensor Suits (ISS) was mounted close to the ground level to be used in collecting the data for meteorological measurements. The diurnal, daily and monthly averages of the data were calculated and used to investigate the vertical surface radio refractivity gradient. The results obtained for both wet and dry seasons during the period showed that the whole months were mostly super-refractive. The month of January has the highest value of -55 N-units/km but the least of about -63 N-units/km occurred in the month of July. The results obtained from this work find relevance in radio engineering for improving VHF/ UHF terrestrial links based on clear-air considerations. There is need to increase the spatial spread of surface and upper air weather stations, and to extend the period of measurements to obtain more reliable surface and upper air refractivity profiles which will support effective planning of terrestrial radio networks in Nigeria.

Keynotes: Terrestrial radio links; meteorological variable; vertical surface radio refractivity gradient.