Influence of some meteorological factors on tropospheric radio refractivity over a tropical location in Nigeria

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ABSTRACT. Radio refractivity is computed from the measurements of atmospheric pressure, temperature and relative humidity made in Akure (7.15° N, 5.12° E), Nigeria using Davies 6162 wireless vantage Pro2 Weather Stations (Integrated Sensor Suite, ISS). Measurements are taken at five different levels starting from the ground surface to 200 m altitude at intervals of 50 m. Five years of data (January 2007 - December 2011) were utilised for the study. Results show that at all the levels, water vapour pressure has the most significant influence on radio refractivity. Temperature also influences refractivity as high values of refractive index are recorded in the transition months of November and Harmattan period of December/January that are usually associated with high air humidity and low water vapour content. Pressure has the least influence, since significant changes in the measured value of pressure often correspond to minimal changes in value of radio refractivity.

Key words – Troposphere, Refractivity, Pressure, Water vapour, Temperature.