ADAPTIVE NEURO-FUZZY INFERENCE SYSTEM (ANFIS) MODEL FOR PREDICTION OF VERTICAL PROFILE OF RADIOCLIMATIC PARAMETERS

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ABSTRACT

This study presents Adaptive Neuro-Fuzzy Inference System (ANFIS) model for prediction of vertical profile of radioclimatic parameters, particularly, temperature, atmospheric pressure and relative humidity. The ANFIS model was developed and validated using, twelve months radiosonde vertical profile data of air temperature, atmospheric pressure and relative humidity which was obtained from the Nigerian Meteorological Agency (NIMET) for Calabar in Cross River state of Nigeria. The altitude considered in the study is from a height of 0 m (surface) to 1000 m. The results revealed that prediction obtained by ANFIS has prediction accuracy via mean absolute percentage error (PAMAPE) that is greater than 90% for temperature, pressure, relative humidity and refractivity. The model help wireless network designers and other stakeholders that need the vertical profile of the primary radioclimatic parameters to obtain the vertical profile data based on the surface measured parameter value that does not require lunching of radiosonde equipment into the atmosphere.

Keywords: Adaptive-Neuro Fuzzy Inference System, Radioclimatic Parameters, Vertical Profile.