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An Ionospheric Index Model based on Linear Regression and Neural Network Approaches

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The ionosphere is well known to reflect radio wave signals in the high frequency (HF) band due to the present of electron and ions within the region. To optimise the use of long distance HF communications, it is important to understand the drivers of ionospheric storms and accurately predict the propagation conditions especially during disturbed days. This paper presents the development of an ionospheric storm-time index over the South African region for the application of HF communication users. The model will result into a valuable tool to measure the complex ionospheric behaviour in an operational space weather monitoring and forecasting environment. The development of an ionospheric storm-time index is based on a single ionosonde station data over Grahamstown $(33.3^{\circ}S, 26.5^{\circ}E)$, South Africa. Critical frequency of the F2 layer (foF2) measurements for a period 1996-2014 were considered for this study. The model was developed based on linear regression and neural network approaches. In this talk validation results for low, medium and high solar activity periods will be discussed to demonstrate model's performance.