

The Australian Bureau of Meteorology activities for the regional ionospheric modelling.

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Abstract:

The Australian Bureau of Meteorology through its Space Weather Service (SWS) provides ionospheric products and services to a diverse group of customers. Research and development within SWS is focussed both on developing tailored products and services for the key customer groups, and supporting the Australian Space Forecast Centre (ASFC) operations. This paper proposes an approach to regional ionospheric Total Electron Content (TEC) modelling using the Spherical Cap Harmonic Analysis (SCHA) and an Empirical Orthogonal Function (EOF) analysis based data assimilation model to map the ionospheric layer parameter f_oF2 . The SCHA model is based on longitudinal expansion in Fourier series and fractional Legendre co-latitudinal functions over a spherical cap-like region including the Australian continent. In the assimilative model, EOF patterns and observations are assimilated to obtain the observed EOF coefficients used to construct the Australian region f_oF2 maps. We outline the design of the assimilative model and the chosen parameters.

Keywords: TEC, f_oF2 , SCHA, EOF, data assimilation