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In this study, we present the results of validation of modeled f_oF_2 (F2 layer critical frequency) and TEC (Total Electron Content) during the solstice on the 21-24 June 2015 geomagnetic storm. The solstice storm was the second strongest geomagnetic storm of cycle 24 with minimum Dst value of -197 nT (G4 class). Both TEC and f_oF_2 changes and percentage changes were considered in comparison with the quiet time background. Also, comparison was made between the modeled quantities and the ground-based observations of the vertical Global Navigation Satellite System TEC at the four locations selected in the low-latitude South American sector. The model's performance was quantitatively evaluated using the root mean square error (RMSE) and percentage changes. An average RMSEs of TEC were calculated between ~ 5 and ~ 10 TECu (1 TEC Unit = 1016 el/m²) whereas an average RMSEs of f_oF_2 range from about 1 MHz to 2.5 MHz. Our results showed a dependence of the NeQuick 2 model on geomagnetic activity with RMS errors increasing with increasing dip latitude.

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