

# **A comparative study of the ionospheric F-region observations in the Brazilian low latitude region and the TIMEGCM model results during the super geomagnetic storm of 20 November 2003**

**F. Becker-Guedes** (1), Y. Sahai (1), P. R. Fagundes (1), G. Crowley (2), W. L. C. Lima (3)

(1) Universidade do Vale do Paraíba, S. J. Campos, SP, Brazil, (2) Southwest Research Institute, San Antonio, TX, U.S.A. (3) Centro Universitário Luterano de Palmas, Palmas, TO, Brazil (fabio@univap.br / Fax: +55 12 3947 1149 / Phone: +55 12 3947 1146)

The TIMEGCM is a global 1st principles model of the ionosphere-thermosphere (I-T) system with fully coupled and interactive ionospheric and thermospheric components. The model requires a specification of the high latitude electric potential distribution for each time step, along with specification of the auroral particle precipitation. Each of these parameters is obtained by use of the AMIE (Assimilative Mapping of Ionospheric Electrodynamics) technique which assimilates data from nearly 200 ground-based magnetometers, several DMSP satellites, and the SuperDARN radar network. In this paper we compare ionospheric observations from two low-latitude ionospheric sounding stations with predictions from the TIMEGCM during the super geomagnetic storm of 20 November 2003. The super geomagnetic storm with SSC at 08:03 UT on 20 November attained  $|Dst|_{max} = 472$  nT at 20:00 UT (20/11). The digital ionosondes (using the Canadian Advanced Digital Ionosondes (CADIs)) are located at Palmas (PAL; 10.2°S, 48.2°W; dip latitude 5.5°S; a near equatorial station) and São José dos Campos (SJC; 23.2°S, 45.9°W; dip latitude 17.6°S; station located under the crest of equatorial ionospheric anomaly), Brazil. Comparisons of model predictions with ionospheric observations during intense geomagnetic disturbances are important studies related to space weather forecasting. Salient features from this comparative study are presented and discussed in this paper.