TEC, L-band scintillation and zonal plasma drifts measured by the Brazilian GPS receiver network

M. T. A. H. Muella (1), E. R. de Paula (1), I. J. Kantor (1), L. F. C. de Rezende (1), M. Fedrizzi (2), F. S. Rodrigues (3), P. M. Kintner (3)

(1) Instituto Nacional de Pesquisas Espaciais - INPE, Sao Jose dos Campos, Brazil, (2) NOAA-SEC, Boulder, USA, (3) Cornell University, Ithaca, USA (mmuella@dae.inpe.br / FAX: +55 12 3945-6990)

Since September 1997, in a collaborative project involving the Aeronomy group from National Institute for Space Research (INPE) and the Space Plasma Physics group from Cornell University, a network of twelve GPS receivers was established for the purpose of monitoring nighttime amplitude scintillations at the L1 frequency (1.575 GHz). Also, a chain of twenty dual-frequency GPS receivers operated by the Brazilian Institute for Geography and Statistic (IBGE) has been used for total electron content (TEC) measurements. The scintillation monitors (SCINTMON) developed by Cornell University have been in routine operation and have provided an excellent database used as a tool for Aeronomic studies, such as, the latitudinal-longitudinal morphology of ionospheric irregularities, their changes and responses due to geomagnetic disturbances and, dynamics of equatorial and low-latitude Fregion irregularity zonal drifts. The dual-frequency GPS receivers have been used to generate storm time maps of total electron content dynamics. In this work, the GPS TEC and scintillation receivers network will be described, and some relevant observational results during the past seven years (1998-2005) of operation will be present and discussed.