LATITUDINAL TEC PROFILES OVER ARGENTINA
BASED ON NNSS DIFFERENTIAL DOPPLER
MEASUREMENTS DURING THE PERIOD 1994–1996

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Differential Doppler measurements at the NNSS 150/400 MHz radio beacons were used to derive latitudinal profiles of TEC over Argentina. The measurements have been carried out in the frame of the German/Argentinean TECUA project. During this project NNSS receivers were installed in Argentina along a meridional chain at different places such as Tucuman, Mendoza, Trelew, and Ushuaia.

The selected observation sites are suited to monitor the total ionization of the ionosphere over South America in the latitude range 15°–65° S. Calibrated TEC profiles were obtained by applying the two-station-calibration technique.

To derive the mean diurnal and latitudinal variation of the ionosphere over Argentina, the observations are monthly averaged over the whole observation period. The observations near 60 W longitude indicate the position of the southward crest region at about 20–30° S. The observations are discussed and compared with corresponding TEC data computed from the IRI95 model.

Keywords: differential Doppler measurements; IRI 95; NNSS; total electron content, TEC

1. Introduction

The begin of the installation of a NNSS receiver network in Argentina within the TECUA project and preliminary results have been reported earlier (Jakowski et al. 1994).

The differential Doppler measurements made within the TECUA project at different stations along a meridional chain cover the period March 1994 – December 1996. All the stations which were included in the measuring program for a certain time are listed in Table I and indicated in a geographical map shown in Fig. 1.

It becomes clear that the distribution of receiving stations is well suited to monitor the ionosphere in the latitude range 15 – 65°S over the South American sector, thus including mid-latitudes as well as the crest region of the equatorial anomaly. Up to now only a few long-term TEC observations have been made over South America under low solar activity (LSA) conditions by Grimolizzi (1980). More knowledge about TEC variations is available for high solar activity conditions (Ezquer and Ortiz de Adler 1989).

This study is an attempt to give a first-order-estimation of the latitudinal dependence of TEC over South America under low solar activity conditions. It should

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Table I. TECUA receiving ground stations

<table>
<thead>
<tr>
<th>Station</th>
<th>Abbr.</th>
<th>$\varphi$ [$^\circ$S]</th>
<th>$\lambda$ [$^\circ$W]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salta</td>
<td>SA</td>
<td>24.7</td>
<td>65.4</td>
</tr>
<tr>
<td>Tucuman</td>
<td>TU</td>
<td>26.8</td>
<td>65.2</td>
</tr>
<tr>
<td>Mendoza</td>
<td>ME</td>
<td>33.0</td>
<td>68.8</td>
</tr>
<tr>
<td>Trelew</td>
<td>TR</td>
<td>43.2</td>
<td>65.3</td>
</tr>
<tr>
<td>Ushuaia</td>
<td>UA</td>
<td>54.9</td>
<td>68.3</td>
</tr>
</tbody>
</table>

Fig. 1. Distribution of TECUA receiving stations of NNSS satellites over Argentina

be mentioned that these results are provisional since the data analysis has not yet been finished.