Estimation and Assessment of GNSS-derived Zenith Tropospheric Delays from SIRGAS-CON network, with application to Satellite Altimetry

APrado

"Satellite Altimetry is one of the main techniques for observing the oceans on a global scale and has contributed to the knowledge of the Mean Sea Level (MSL) and its variations. The main measurement of altimetric satellites is the distance between the satellite and the ocean surface, (Range), which is incorrect owing to errors caused by the interaction of the signal with the atmosphere and the sea surface, requiring corrections to account for these effects. The troposphere is responsible for most of these errors, including the Wet Tropospheric Correction (WTC), mainly due to the atmospheric water vapour. The altimetric satellites are equipped with instruments called Microwave Radiometers (MWR), which measure the amount of water vapour under the satellite path, providing information for the estimation of the WTC.

MWR fails in coastal regions and inland waters, due to land contamination present in these areas. In view to recover the WTC in these regions, the GNSS (Global Navigation Satellite System) derived Path Delay Plus (GPD+) method, developed by the University of Porto, uses Zenith Tropospheric Delays (ZTD) from GNSS global and regional networks' stations combined with other sources of information. In order to densify the existing dataset used in GPD+, it is necessary to introduce new stations, mainly in the southern hemisphere, in regions such as South America, Africa and Oceania.

This work aims to exploit the Latin America and Caribbean SIRGAS-CON network and its potential for densification of the GPD+ input dataset in this region. It is intended to evaluate the accuracy and stability of the WTC derived from the stations of this network, by comparison with other GNSS networks and atmospheric models and include the stations that meet GPD+ requirements. It is expected that the introduction of these new stations will improve the algorithm performance, making it more efficient in these regions and that this information can be used operationally."