

Tropospheric corrections for coastal altimetry

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For many years, the wet tropospheric correction has been one of the major error sources in coastal altimetry. Recently, various approaches have been proposed for correcting the altimeter measurements in the coastal regions, where the Microwave Radiometer (MWR) measurements become invalid due to land contamination in the radiometer footprint.

Three main approaches have been proposed: (1) correction of the MWR measured Brightness Temperatures (TB) from the percentage of land in the radiometer footprint, (2) GNSS-derived Pat Delay (GPD) and (3) Dynamically Linked Model (DLM). The first method has been implemented to Jason-2 data in the scope of project PISTACH. The last two methods have been developed and implemented in the scope of the ESA project COASDTALT for the generation of Envisat Coastal Geophysical Data Records (CGDR).

This study presents a brief introduction to each method, with emphasis to the GPD and DLM algorithms and its application to Envisat altimetry.

The main issues and the latest developments related with the GPD approach will be discussed: data requirements, data combination, ability to provide total or separate (dry and wet) tropospheric corrections and possibilities for global implementation.

Finally, these methods are inter-compared with respect to various issues: data requirements, accuracy, local/global implementation and specificities of the application to each satellite mission. In particular, the application of these techniques to correct ERS altimetry is also discussed.