

World Wide Synthetic Tide Parameters a promising tool for high precision tidal prediction

K.H.Zahran

National Research institute of Astronomy and Geophysics, Helwan, Cairo, Egypt

Computations of a synthetic Earth tide parameters by adding the body tide contribution to the ocean tide loading contribution (OTL) on a world wide regular grid is considered to be a promising tool for high precision tide prediction. The advantage of such computations is that the user of the synthetic parameters does not have to carry out the time-consuming OTL computations and that the final set of computed parameters may be used by tide specialists and non-specialists to predict Earth tide at any time every where for local regional or continental applications.

A synthetic Earth tide parameters (Zahran et al. 2005) have been developed on a world wide grid for gravity, vertical and horizontal displacements. Synthetic parameters have been computed using Wahr-Dehant model and different TOPEX/Poseidon ocean tide models. However, beside the Earth tide parameters synthetic ocean tide parameters are also given separately for many other applications.

The accuracy and the reliability of the synthetic tide parameters have been estimated by comparison with observed gravity and vertical displacement tide parameters with those interpolated from the presented synthetic model, which shows good agreement. Tests of the model shows small discrepancies with the observed tidal gravity parameters and a good agreement with tidal displacements parameters, estimated from long period VLBI and GPS observations.

An accuracy assessment study to the selected ocean tide models indicates that the selected models is still problematic in the coastal areas and shelf regions. However, recent generation of derived TOPEX/Poseidon ocean models shows better agreement in coastal area. Thus, the synthetic model has to replace a recent ocean tide model with higher resolution to fulfill the accuracy needed for precise gravity and space geodetic techniques.

BIBLIOGRAPHY

Zahran K.H., Jentzsch G., Seeber G. (2005): World-wide synthetic tide parameters for gravity and vertical and horizontal displacements. *J. Geodesy*, 79, 293-299.