



Satellite altimetry measurements and in situ observations of hydrologic regime of Gorky Reservoir of the Volga River

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Measurements of water level dynamics in Gorky Reservoir of the Volga River are of interest for water resource management and climate observations in Nizhny Novgorod region. In situ measurements using hydro gauging stations are often incomplete due to geographical, political or economic reasons. On the other hand the satellite microwave technique of water level measurements is applicable at any time of day, almost any weather, and even if there is enough high concentration of aerosols in the air. One of the recent applications of satellite altimetry originally designed for measurements of the sea level is associated remote investigation of the water level of inland waters. The problem of the data calibrating and validation is of special interest for such measurements, because standard altimetry data processing developed for the open ocean conditions can be inapplicable for this case. The main aim of this work is comparing of altimetry data with in situ measurements for the water level of Gorky Reservoir. The analysis is based on the data from current Jason mission as well as data from the original TOPEX / Poseidon archive. For the altimetry data processing we used the technique designed by LEGOS. The dependences of ten-day and monthly averaged water levels of Gorky Reservoir and Volga River in the period from 1992 to 2007 were obtained. Systematic error in determining water level in comparison with in situ data is measured; accuracy of the water level variations is determined. With the purpose of improvement of satellite data on heights of a water level the analysis of waveforms is undertaken. The theoretical model for the description of influence of coast of the reservoir on the received waveform is constructed. The results will be used for creating of a physically based re-tracking algorithm.