



DAHITI - An Innovative Approach for Estimating Water Level Time Series over Inland Water using Multi-Mission Satellite Altimetry

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Satellite altimetry has been designed for sea level monitoring over open ocean areas. However, for some years, this technology has also been used to retrieve water levels from lakes, reservoirs, rivers, wetlands and in general any inland water body.

In this contribution, a new approach for the estimation of inland water level time series is presented. The method is the basis for the computation of time series of rivers and lakes available through the web service 'Database for Hydrological Time Series over Inland Water' (DAHITI). It is based on an extended outlier rejection and a Kalman filter approach incorporating cross-calibrated multi-mission altimeter data from Envisat, ERS-2, Jason-1, Jason-2, Topex/Poseidon, and SARAL/AltiKa, including their uncertainties. The new approach yields RMS differences with respect to in situ data between 4 cm and 36 cm for lakes and 8 cm and 114 cm for rivers, respectively.

Within this presentation, the new approach will be introduced and examples for water level time series for a variety of lakes and rivers will be shown featuring different characteristics such as shape, lake extent, river width, and data coverage. A comprehensive validation is performed by comparisons with in situ gauge data and results from external inland altimeter databases.