



Robust estimation of radar altimetry based lake levels

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The high along-track resolution in synthetic aperture radar (SAR) mode makes it possible to accurately measure closer to the lakes shores than previously. However, the footprint width is still up to 15 km in the across-track direction, which implies that some waveforms will be polluted with signals from the surrounding land. In some cases retracking of these contaminated waveforms lead to incorrect height estimates of the water surface. It is therefor important to account for these polluted observations when estimating the mean water levels and subsequent time series to obtain an optimal solution.

Here we present a novel method to estimate the mean lake level. Instead of attempting to identify and remove the polluted observations we use a mixture distribution to describe the observation noise, which prevents the polluted observations from biasing our final reconstructed time series.

We demonstrate the potential of the method with CryoSat-2 data from lake Vänern (Sweden)