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Monitoring lake levels by retracking Envisat altimeter data: A case study on Lake Constance

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In this poster we investigate the possibility to monitor the levels of lake Constance by using satellite altimeter data from Envisat. The lake Constance, located at the border of Switzerland, Austria and Germany, has a length of 63 km (East-West) and a width of only 14 km. The primary inflow and outflow is the river Rhine. There are only two Envisat tracks crossing the lake over a length of about 10 km. Due to the fast crossing there are only one or two 1Hz data points separated by about 7 km. Using the high-frequent 20Hz data is also critical because the default retracking algorithms are optimized for ocean and ice applications respectively. Therefore a dedicated retracking must be performed to achieve better lake levels than 1Hz and 20Hz data provide. Retracking is accomplished by using different retracking algorithms such as Beta-Retracker or Center of Gravity Retracker.
The validation of the lake level is done by using information from station level which are available around the Lake Constance.