

Vertical Land Movements in Coastal Areas Around Northern and Baltic Sea Within Germany

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SUMMARY

The determination of vertical land movements in coastal areas is a prominent topic all over the world. In this research project it was possible to analyse GNSS time series and Sentinel radar data to estimate the actual movement rates for coastal zones within Germany.

In total, GNSS data sets from 180 permanent stations between 2010 and 2016 were evaluated and analysed; applying an innovative approach, it was possible to reference the results of these time series to stable zones in low mountain ranges. Sentinel-1 data sets from 2014 to 2019 were independently processed using the Persistent Scatterer (PS) methodology, resulting in an area-wide motion field for the study area.

For numerical modelling of the velocity field a functional model was applied (no-mesh concept), based on position-related radial-basis-functions (RBF) and allowing the combination of clustered radar data and GNSS-time series.

As final result for the period of investigation the vertical movements in the area of the German Northern and Baltic Sea were computed and compared with external knowledge resp. influence factors.

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