



Capturing vertical land movement and sea level changes

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Under the light of global warming and sea level rise, which is the challenge of 21st century, precise measurements of vertical land movement and sea level changes are essential for many kinds of scientific and engineering activities. Today's technology provides measuring devices such as radar gauges to measure sea level and GNSS sensors for precise positioning. In spite of all these new technology most gauging stations in Germany are currently not equipped with these devices. In coastal areas the sea level is still measured with a float within a stilling well and the geodetic monitoring is done by levelling. To overcome this problem a field test is under way to compare these techniques at the same location.

The station 'Sassnitz' was chosen as a test site. It is located at the east coast of the island Rügen in the southern Baltic Sea. The tide gauge in Sassnitz is an official gauging station of the Federal Waterways and Shipping Administration (WSV). Close to this tide gauge is a GNSS station of the German Reference Network (GREF). The tide gauge itself is equipped with a float system and allows to install the radar sensor next to the float system, to have direct comparison of both sea level readings. A GNSS antenna is mounted directly on top of the radar gauge. It enables a continuous control of the height of the radar gauge zero. The gained data set of sea level and geodetic measurements allow us to have a look on both hydrological and geodetic information.

The first results are promising. Generally, the daily mean sea level of both gauges shows a good agreement of better than two millimetres. The zero point of the radar gauge can be monitored with an accuracy of a few millimetres. Comparisons between

GNSS derived height differences and local levellings correspond int the order of a few millimetres, which is the estimated accuracy of both techniques.