

Vertical datum connection at tide gauges: connecting InSAR

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Sea level rise and land subsidence pose a combined threat for coastal areas such as the Dutch Delta. It is particularly the combination of both these off shore and on shore dynamic processes that needs to be known to significant detail when water defence infrastructure is designed for the coming century.

Geodesy has produced several independent techniques in the off-shore and on shore domains. One critical aspect is that the independent techniques are all referenced to the same vertical geodetic datum. For small magnitude processes this is far from trivial. One exception to the theory-laden definition of datum connection is forced collocation of techniques at tide gauge stations. Here, the tide gauge water level measurements are combined with levelling and GNSS.

Here we present a method to integrate radar interferometric measurements to the tide gauge platform data. We do this by installing electronic transponders to the GNSS masts on the platform. This enables us to know the dynamic behaviour of the reference datum for the interferometric surveys, and thereby reference millions of deformation measurements to a geodetic datum.