



## Vertical land movement rates from the analysis of GPS data compared with tide gauge, hydrology model and GRACE data

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Tide gauge measurements are affected by land movement on almost all global coastlines. Especially in tectonically active areas like Japan, the tide gauge time series are strongly affected by earthquakes and subsequent land movement.

Linear trends are calculated from the results of the TIGA repro1 reprocessing campaign. Several examples of unusual land movement at tide gauges as well as continental stations are examined in detail and compared with data from tide gauges, hydrology models, and GRACE water mass. These comprise, e.g., trend changes caused by earthquakes, land movement from draughts, or spurious trends from snow cover on the GPS antenna.

Precise weekly positions of 403 Global Positioning System (GPS) stations located worldwide are obtained by reprocessing GPS data of these stations at the time span from January 1998 until December 2007. The used processing algorithm and models as well as the solution and results obtained are presented. Vertical velocities of GPS stations having tracking history longer than 2.5 years are computed and compared with the estimates from the co-located tide gauges and other GPS solutions.

The derived time series and vertical motions of continuous GPS at tide gauges stations can be used for correcting tide gauge estimates of regional and global sea level changes.

The resulting linear trends and plots of the GPS time series have been made available via FTP at the GFZ Potsdam.