



A comparison of three environmental load combinations with Repro2 residuals

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Three different environmental load combinations are used to estimate surface displacement and correct for the nonlinear variation of daily GPS time series in the Repro2 residuals. Time series of station position residuals are obtained by rigorously stacking the IGS Repro 2 daily solutions, estimating, and then restoring the annual and semi-annual signals. The three surface mass model combinations include 1) ATML (NCEP, IB) + OBP (ECCO) + CWS (GLDAS); 2) ATML (ECMWF) + OBP (OMCT) + CWS (LSDM); 3) ATML (ECMWF, MOG2D) + OBP (OMCT) + CWS (LSDM). In this analysis, 961 stations are selected which have more than one and a half years of observations within the time span from 2002 to 2015. The percentage of reduced WRMS (weighted root mean square) and annual amplitude in the GPS time series are compared globally. In addition, comparisons in model combination 1) and model combination 2) can reveal any difference between NCEP and ECMWF loading. Also, from comparisons in model combination 2) and model combination 3), we can investigate the difference between IB and MOG2D, i.e. and IB and dynamic ocean response to atmospheric pressure loading. To further understanding the performance of IB and MOG2D, stations are grouped according to the ocean fraction of area when the angular distance of the station to the coast is less than 5 degrees.