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Gravity effects obtained from global hydrology models in comparison with high precision gravimetric time series

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Water mass changes are a major source of variations in residual gravimetric time series obtained from the combination of observations with superconducting and absolute gravimeters. Changes in the local water storage are the main influence, but global variations contribute to the signal significantly. For three European gravity stations, Bad Homburg, Wettzell and Medicina, different global hydrology models are compared. The influence of topographic effects is discussed and due to the long-term stability of the combined gravity time series, inter-annual signals in model data and gravimetric observations are compared.
Two sources of influence are discriminated, i.e., the effect of a local zone with an extent of a few kilometers around the gravimetric station and the global contribution beyond 50km. Considering their coarse resolution and uncertainties, local effects calculated from global hydrological models are compared with the in-situ gravity observations and, for the station Wettzell, with local hydrological monitoring data.