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Geodetic hydrological excitation functions by different atmosphere and ocean models and comparison with hydrological excitation functions and GRACE solutions

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The variations in the Terrestrial Water Storage (TWS) through seasonal soil moisture changes, ice and snow loading and melting influence the Earth's inertia tensor. Quantitative assessment of the hydrological effects in polar motion persists unclear because of the lack of global observations as well as differences between various atmospheric and oceanic models.
Here, we compare the results of several geodetic hydrological excitation functions, that are calculated by removing modeled atmospheric and oceanic effects from precise observations of full polar motion excitations.
Geodetic hydrological excitations (GAO), called geodetic residuals as well, are analyzed and compared with hydrological excitation function determined from hydrological models and Gravity Recovery and Climate Experiment (GRACE) satellite mission. The obtained geodetic residuals computed for different models of AAM (Atmospheric Angular Momentum) and OAM (Oceanic Angular Momentum) are different from one model to another. The discrepancies between observed polar motion variations and geophysical contributions appear more likely to be caused by the errors of the atmospheric, in particular of the motion term, and oceanic models.
In this study, we analyze the polar motion budget at decadal, seasonal, and short term oscillations for a most often used models of atmosphere and oceans considered the global mass balance inside AAM, OAM and HAM excitation functions.
Here, we would like to present the consistency between full polar motion excitations and geophysical excitations, that are the sum of AAM (pressure + wind) and OAM (bottom pressure + currents) contributions. This analysis could let us indicate, which components of different AAM and OAM models cause the biggest errors in the geodetic budget.