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Polar motion excitation from several models of land hydrosphere

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The impact of land hydrosphere mass variations on polar motion excitation is still not sufficiently estimated and not known as well as the role of the atmosphere and ocean.
A comparison of the hydrological excitation function (Hydrological Angular Momentum – HAM) with observed geodetic excitation functions (GAM) is a common method of assessing of the influence of land hydrology on polar motion excitation function. HAM can be estimated either from global models of the land hydrosphere or from the Earth's gravity field variations.
Our previous attempt to assess the role of land hydrology in the excitation balance using the hydrological angular momentum (HAM) estimates from Gravity Recovery and Climate Experiment (GRACE) data and hydrological models was not conclusive (Brzeziński et al., 2009, Nastula et al., 2011, Wińska et al., 2016).
We found for example that gravimetric-hydrological excitation functions, based on the Gravity and Climate Recovery Experiment (GRACE) gravity fiels determined from the several processing centers differed significantly. Additionally hydrological excitation computed from different hydrological models differed significantly in amplitudes and phases.
In this work we re - estimate hydrological polar motion excitation functions from several hydrological models and climate models and from GRACE gravity fields.
Our investigations are focused on the influence of land hydrosphere on polar motion excitation functions at seasonal and non-seasonal time scales and comprises two steps:
• first determinations hydrological excitation functions (HAM) from regional distribution of Terrestrial Water Storage (TWS).
• the second comparison of the global HAM with hydrological signal in the observed geodetic excitation function of polar motion.