



# **Assessment of the Global and Regional Land Hydrosphere and Its Impact on the Balance of the Geophysical Excitation Function of Polar Motion**

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## **A b s t r a c t**

The impact of continental hydrological loading from land water, snow and ice on polar motion excitation, calculated as hydrological angular momentum (HAM), is difficult to estimate, and not as much is known about it as about atmospheric angular momentum (AAM) and oceanic angular momentum (OAM). In this paper, regional hydrological excitations to polar motion are investigated using monthly terrestrial water storage data derived from the Gravity Recovery and Climate Experiment (GRACE) mission and from the five models of land hydrology. The results show that the areas where the variance shows large variability are similar for the different models of land hydrology and for the GRACE data. Areas which have a small amplitude on the maps make an important contribution to the global hydrological excitation function of polar motion. The comparison of geodetic residuals and global hydrological excitation functions of polar motion shows that none of the hydrological excitation has enough energy to significantly improve the agreement between the observed geodetic excitation and geophysical ones.

**Key words:** polar motion, land hydrosphere models, GRACE data.