



## **Three different approaches for the determination of polar motion excitation series**

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Polar motion excitation series can be determined from (1) Earth rotation parameters, (2) Earth gravity field changes and (3) mass displacements and movements in the Earth system. These three approaches are almost independent from each other regarding the introduced observations and the underlying formalism.

As part of an ongoing quality assessment of these processes this study compares the mass-related part of the polar motion excitation functions. The results indicate that the mass-terms of the equatorial excitation functions are in general well recovered by monthly gravity field changes derived from observations of the satellite mission GRACE and/or LAGEOS 1&2. Nevertheless until now these geodetic solutions are not always more accurate than the results of geophysical models. But due to the combination of polar motion excitations derived from numerous gravity field models (GFZ, CSR, JPL, ITG-Grace03, GRGS, SLR) the results can be improved. They show the highest agreement with the integral excitations estimated from the Earth rotation parameters after subtracting the motion-related contributions from atmospheric winds and ocean currents.