Abstract:
Dynamic processes in the Earth system involving mass transports in the subsystems atmosphere and ocean are known to be the prominent sources for changes of Earth rotation on sub-seasonal to interannual time scales. Since respective geodetic observations of polar motion and variations of length-of-day are integral quantities, numerical model approaches are required in order to assess individual contributions from underlying processes in different subsystems. This paper discusses simulations of polar motion from the dynamic Earth system model DyMEG. Results for two different model set-ups are presented: First, realistic forcing based on reanalysis data is applied. Second, DyMEG is forced by scenario runs over 200 years (1860-2060) based on a fully coupled atmosphere-hydrosphere model. Special attention is drawn to the long-term development of the modelled Chandler oscillation and its excitation mechanisms. It is shown that simulated and observed patterns of amplitude variations of the Chandler oscillation agree very well. Various experiments reveal that wind is its most important driving mechanism.