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The Variations of Earth Rotation Excited by the Atmosphere- A Further Analysis of the Method and Data t*


The Variations of Earth Rotation Excited by the Atmosphere- A Further Analysis of the Method and Data t*

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Abstract Motion of the atmosphere with respect to the solid earth causes the relative atmospheric angular momentum (RAAM), and its variations may excite the variations of earth rotation on multiple timescales. Two methods are used when calculating the RAAM: the SP method, in which the contributions of winds to the RAAM are integrated from the topographic surface to the top layer of the atmosphere and the BP method, where the integration starts from the 1000 hPa level. We have made a detailed comparison of the RAAMs obtained by the two methods. With the meteorological reanalysis data from the European Center for Medium Range Weather Forecast (ECMWF) and the National Centers for Environmental Prediction (NCEP), we have restudied the temporal and spatial characteristics of the variations of RAAM. From an analysis of the seasonal mean and amplitude of the RAAM and an analysis of its space-time characteristics, it is found that the two data sets (ECMWF and NCEP) give similar results, apart from some marked differences in the Asian monsoon area and the Antarctic region.

Key words: earth rotation--relative atmospheric angular momentum (RAAM)--BP method--SP method

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