

Comparison of changes in Earth rotation with temperature changes in the recent century

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Chandler wobble is the resonant motion of the Earth pole, which was discovered more than a century ago. It is supposed that atmospheric and oceanic processes supply energy for it. To reveal the sources of the Chandler excitation and their spatiotemporal behavior, we study atmospheric angular momentum (AAM) geographical maps since 1948 yr, by applying multichannel singular spectrum analysis (MSSA, [1]) and Panteleev filtering in the Chandler frequency band.

We also try to find explanations for similarities between the curves of Earth rotation changes and global mean temperature anomalies. The latter, besides the global warming "hockey stick", shows about 20-year period variability. In [2] presence of a 18.6-year amplitude modulation in the Chandler excitation was revealed. In [3] it was shown that the Moon tide could play an important role in the weather variability and atmospheric circulation.

This joint study is an attempt, to draw attention to these interesting facts and to obtain pro and contra of the hypothesis of the existence of a common factor, that influences both Earth rotation changes and climate variability.

[1] <http://Infm1.sai.msu.ru/~tempus/science/MSSA/index.htm>

[2] Sidorenkov N.S., The interaction between Earth's rotation and geophysical processes. WILEY-VCH Verlag GmbH and Co. KGaA, Weinheim, 2009, 305 pp.

[3] L. Zotov, Dynamical modeling and excitation reconstruction as fundamental of Earth rotation prediction, Artificial Satellites, Warsaw, Vol. 45, N. 2, 2010, p. 95-106.

The first author is supported by the Chinese Academy of Sciences Fellowship for Young International Scientists grant.

Keywords: Earth rotation, atmospheric circulation, climate change