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Title: Heterogeneity of the long-term dynamics of the global temperature data

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Abstract:

We have investigated scaling properties of the two datasets of the observed global temperature data anomalies: the UK Met Office HadCRUT4 dataset, and the NASA GISS Land-Ocean Temperature Index (LOTI) dataset. We calculated the DFA2 exponents on the entire grids of these datasets, together with the corresponding wavelet transform (WT) power spectra, in order to be able to determine the long-term dynamics of the data, and to have an insight into the existence and overall importance of the cycles in the recorded temperature time series.

Our results show a remarkable heterogeneity in the long-term dynamics of the global temperature anomalies in both datasets. This finding is a confirmation of a numerous previous ground or sea recording stations temperature time series scaling analyses. At the same time, it poses questions about the sources of such diverse scaling, particularly about the source of the observed clear differentiation between the land and the ocean DFA2 temperature dynamics. We discuss this question in the light of the possible cyclic influence that brings about the perceived change, which can be assessed through WT analysis.

References:

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