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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Scaling behaviour of the global tropopause" *by* C. Varotsos et al.

C. Varotsos et al.

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Long range dependence from Richardson (1926) to Samorodnitsky (2007)

Authors response to the reviewers comments
(by C. Tzanis)

We thank both referees for their fruitful reviews.
Below we respond to their comments:

Referee 1:

We greatly appreciate his/her support to our findings. In particular, his/her statement that our paper "presents new and substantial results" is encouraging for our future work on the field.
We fully agree with his/her comments and therefore we will take into account all of them in the revised version, notably:

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Discussion Paper

1. We shall mention plausible explanation on our finding about the latitudinal variability of the power-law exponent.
2. We will present a characteristic example on how these results obtained could be used to improve modelling
3. We shall clarify that the persistence found for the interval time ranging from about 4 months to about 6 years has certain physical meaning.
4. All the technical corrections kindly suggested by the referee will be performed.

Referee 2:

1) We have already clarified in our paper that the conventional statistical analysis of the time series has already been presented and discussed elsewhere (Seidel and Randel, 2006).

2) As to the suggestion to resolve the problem of the long-range correlations in the atmosphere (considered as a natural complex system) by setting up or developing a theory, we would like to mention that it is an open problem, since long ago, (e.g. Richardson, 1926, Samorodnitsky, 2007). What we intend to do at the moment is to add to the revised version a brief discussion on the plausible reasons.

3) Regarding his/her point about the missing comparison with model data, we will incorporate in the revised version the DFA results of modelled data.

References

Richardson, L. F.: Atmospheric diffusion shown on a distance neighbour graph, Proc. Roy. Soc. A, 110, 709-737, 1926.

Samorodnitsky, G.: Long range dependence, Foundations and Trends in Stochastic Systems 1(3), 163-257, 2007

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 17891, 2008.

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