

***Interactive comment on* “Technical Note: Long-term memory effect in the atmospheric CO₂ concentration at Mauna Loa” by C. Varotsos et al.**

C. Varotsos et al.

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AUTHOR'S CUMULATIVE ANSWER TO THE REFEREE AND OTHER COMMENTS

M.-N. Assimakopoulos, C. Varotsos, M. Efstathiou

1) We thank the Anonymous Referee no.1 for his/her very encouraging comments about the novelty of the work and its future perspectives.

2) We greatly appreciate the opinion of the Anonymous Referee no.2 about the quality of the work and the usefulness of its findings for the assessment of the climate behaviour. We agree with his/her comment that it would be interesting to discuss how the major finding of the paper “can help in recognition of anthropogenically induced changes caused by increased CO₂ emissions to the atmosphere on the background

of natural atmosphere changes. Will be useful to discuss the mechanisms responsible for obtained feature in details and expand discussion on positive application of received results for climate models and other corresponding issues". We intend to add in Conclusions a paragraph commenting on the suggested issue. We also agree with his/her argument that "the comparison of the DFA-results of Mauna Loa data against South Pole CO₂ observation 1957-2006 time series, will help to make more general conclusions and estimate (or avoid) the local Mauna Loa conditions". We therefore decided to add a special paragraph discussing the findings of the data analysis suggested. This paragraph will also give the DFA results of the daily mean CO₂ data, as requested by the referee. In addition, we shall comment on the effectiveness of the DFA method in small time series and explain the deseasonalization procedure that applied to the CO₂ data. The Figures depicting the results of DFA-2 to DFA-5 will also be included, as suggested. Finally, we shall clarify or correct all the points mentioned in the sub-paragraphs of the review entitled: "other notes" and "technical corrections".

3) We are most grateful to the Anonymous Referee no.3 for his/her very positive review and the supportive clarifications, which are to the point concerning the small size of the CO₂ data used in our analysis. We intend to include his/her arguments to the final version of our paper, especially those that justify, why DFA (and not, for example, wavelet based estimators of self-similarity) was preferred.

4) We thank Dr. Janosi, Dr. Sarlis, Dr. Skordas and Dr. Patra for their very constructive comments and discussion. We fully agree with the outcome of this very interesting discussion, notably: The fluctuations of CO₂ concentration at Mauna Loa exhibit strong long-range correlations, which is basically the primary finding of our paper. As to the exact value of the DFA exponent, it is not of crucial importance, mainly depending on the statistical tools employed. Nevertheless, we intend to include the most important conclusions drawn from this fruitful interactive discussion in our revised paper.

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References

Anonymous Referee no.1: Interactive comment, Atmospheric Chemistry and Physics Discussions, 6, S6209-S6209, 2007.

Anonymous Referee no.2: Interactive comment, Atmospheric Chemistry and Physics Discussions 6, S5208-S5211, 2006.

Anonymous Referee no.3: Interactive comment, Atmospheric Chemistry and Physics Discussions, 6, 2006.

Janosi, I.: Interactive comment, Atmospheric Chemistry and Physics Discussions, 6, S4966-S4968, 2006a.

Janosi, I.: Interactive comment, Atmospheric Chemistry and Physics Discussions, 6, S5109-S5110, 2006b.

Patra P.: Interactive comment, Atmospheric Chemistry and Physics Discussions, 6, S5787-S5788, 2006.

Sarlis N. and Skordas E.: Interactive comment, Atmospheric Chemistry and Physics Discussions, 6, S5095-S5098, 2006a.

Sarlis N. and Skordas E.: Interactive comment, Atmospheric Chemistry and Physics Discussions 6, S5324-S5328, 2006b.

Varotsos, C., Assimakopoulos, M.-N., and Efstathiou, M. : Technical Note: Long-term memory effect in the atmospheric CO₂ concentration at Mauna Loa", Atmospheric Chemistry and Physics Discussions, 6, 11957-11970, 2006.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 11957, 2006.

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