

## ***Interactive comment on “Long-memory processes in global ozone and temperature variations” by C. Varotsos and D. Kirk-Davidoff***

### **Anonymous Referee #1**

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It is a good idea to use detrended fluctuation analysis (DFA) to study a long-term persistence of the total ozone content (TOZ) and troposphere temperature variations (TBT). Obtained correlation patterns add new results to other studies concerned the long-range memory in atmosphere and climate behavior and can help to verify the future climate and weather models. Authors found opposite results for TOZ and TBT fluctuations - persistence at long time scales is strongest for TOZ in tropics and for TBT in mid-latitudes. Will be useful to discuss the mechanisms responsible for this feature in details. However it could be theme for next paper of authors. Will be interesting to extend the analysis to higher latitudes, especially in Southern Hemisphere - Antarctica, however some details for Arctic and Southern Hemisphere have been mentioned.

In conclusion I support the paper, which present new and substantial results. The

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interpretations and conclusions are sufficient to support obtained results. A small doubt exists according the title of the paper: Long - memory processes in global ozone and temperature variations, however authors discussed the data 60N-60S, and not included detailed discussion for 60N-90N and 60S-90S. On my opinion the abstract did not provide complete summary and should be extended including the details discussed in Conclusion. The paper good structured and clears, and contains appropriate number and quality of references. In addition on my opinion will be useful to add the Figure which shown time series of TBT similar as Fig. 1 for TOZ, however it depends of authors decision.

Technical corrections: Page 4328, line 15: "order /" has to be "order 1", "DFA-/" has to be "DFA-1" Page 4331, line 26: " DFA-/" has to be " DFA-1" Page 4332, line 8: mentioned "polar and arctic region" - for me "polar" means polar regions of both hemispheres, needs to clarify, because in next sentences the southern hemisphere is mentioned (line 12). Page 4340: in the Fig. 3 in labels "TRT" need to be replaced by "TBT"

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