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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Technical Note: Long-term memory effect in the atmospheric CO_2 concentration at Mauna Loa" *by* C. Varotsos et al.

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I am very grateful for the notes by Sarlis and Skordas (2006), because they thaught me how to attach figures to an interactive comment. Thus I can illustrate my results for the second and third methods of removing seasonalities from the original CO2 record.

Figure 1: http://lecso.elte.hu/CO2-DFAtest-2.jpg

(a) Mauna Loa monthly averages from January 1959 till December 2004 (black). Fitted polynomial trends of order 10 (red) and order 3 (blue). **(b)** The residuals by subtracting the polynomial trends. Red: order 10, blue: order 3. **(c)** Remaining fluctuations after subtracting the 46-year monthly averages. **(d)** DFA-1 ... DFA-5 curves (from top to bottom) for the red time series in (c). "Characteristic" slopes are indicated. **(e)** The

same as (d) for the blue time series in (c). Note that the unit slope is not fitted, it is an illustration of the proposal by Sarlis and Skordas (2006).

Figure 2: http://lecso.elte.hu/CO2-DFAtest-3.jpg

(a) The same as Fig. 1(a) with the 10th order polynomial trend. **(b)** The same as Fig. 1(b), red signal. **(c)** Remaining fluctuations after cutting out the spectral peaks of 6 and 12 months by a Wiener filter. **(d)** Periodograms of the signal in (b) (black), and in (c) (red). **(e)** DFA-1 ... DFA-5 curves (from top to bottom) for the red time series in (c). "Characteristic" slopes are indicated.

I hold to my opinion that DFA scaling can not be convincingly established for the 552 monthly average values. I think that the key problem is to separate fluctuations from the various trends, which can affect the statistical inference on correlation properties.

References

Sarlis, N.V., and Skordas, E.S., Interactive comment on “Technical Note: Long-term memory effect in the atmospheric CO2 concentration at Mauna Loa” by C. Varotsos et al., Atmos. Chem. Phys. Discuss., 6, S5095-S5098, 2006.

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