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Interactive comment on "A scaling analysis of ozone photochemistry: I Model development" *by* B. Ainslie and D. G. Steyn

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In this paper, authors have used dimensional analysis, to provide simple representations of the behaviour of several photochemical mechanisms.

They suggest that the scaling analysis of ozone photochemistry, similarity curve and parameterization appear to be independent of the details of the chemical mechanism.

In order to facilitate the interpretation of their results, they have studied photochemical mechanisms in isolation from important physical processes which compete with chemical processes in the field.

It would be of interest to stress that the scaling behaviour of the air-pollutants fluctuations were

recently investigated (Varotsos et al, 2005) by analyzing the time-series of hourly-average O_3, NOx, and PM10 concentrations, using the detrended fluctuation analysis (DFA) method after deseasonalizing. The main findings deduced from this investigation were:

1) Persistent long-range correlations in the fluctuations of daytime and nighttime ozone concentrations measured in Athens were detected at temporal scales of about 1 week to 5 years with more intense correlations ("stronger memory") during daytime. The fluctuations of nitrogen oxides exhibit similar behaviour.

2) For the interval time ranging from about 4 hours to 9 months persistent long-range power-law correlations in PM10 fluctuations prevail. Persistency from about 4 hours to 15 days is exhibited also by the fluctuations of PM2.5 concentrations measured in Baltimore, reflecting remarkably similar processes driving the about 4-hr time lags.

Presumably, the fact that more intense long-range power-law correlations were detected during daytime by Varotsos et al (2005) can be considered as an evidence of the scaling behaviour of several photochemical mechanisms mentioned in the paper by Ainslie and Steyn.

Reference: Varotsos C., Ondov J., Efstathiou M. (2005), Scaling properties of air pollution in Athens, Greece and Baltimore, Maryland, Atmos. Environ. 39 (22): 4041-4047.

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