

Interactive comment on “Case studies of ozone transport between North America and Europe in summer 2000” by G. Guerova et al.

G. Guerova et al.

Received and published: 20 February 2006

Acpd-2005-0203: Impact of transatlantic transport episodes on summertime ozone in Europe

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Final respond to the general comments of Ref#2

“However, the proportions between different sections and figures/text are not always

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optimal as indicated in several examples below. The ratio figures/text is quite high, but the referee has no suggestions for figures that are unnecessary. A lot of information is contained in the Figures 10-14 which could be discussed in more detail in section 5.2.”

The number of figures has been reduced, as the focus of the work is now more on the impact of LRT events rather than on the transport pathways. Section 5 has been rewritten and the MOZAIC profiles better discussed.

“The referee has the feeling that the authors miss the point to give proper credit to related work and clearly indicate their own new/original contribution (novel concepts). The English language of the paper is good but can still be improved. It is recommended that a native speaker reads the paper.”

Those remarks have been taken into account (see respond to the general comments of Ref#1).

Reply to the specific comments of Ref#2

Title:

“The title of the paper is not suitable chosen. The reader...”

We propose the following title: “Impact of transatlantic transport episodes on summertime ozone in Europe”

Introduction:

“In section 1 a description of state of the art is almost missing. In the first paragraph

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only a few papers on the topic are mentioned though a deeper discussion into the results from these papers is missing and should be included (especially from the Li et al., 2002 paper)...”

The suggestions concerning the introduction have been taken into account. The introduction is revised and now includes a number of suggested references.

Section 2, 4:

“In section 3.2 it is mentioned that the model underestimates ozone in the FT. Some possible explanations/uncertainties are given (stratospheric downward flux, uplift of EU sources, transport from North America). What implications can this have on the mixing ratios given: NA-O₃ in the FT over EU 10-13 ppb? Does it mean that the influence from NA-O₃ can be about twice as high as given in this paper? These uncertainties should be discussed in more detail in the conclusions.”

We have now introduced (section 5.1) a more detailed discussion on the respective role of stratospheric input and European contribution at JFJ. We conclude that the stratospheric contribution is likely reasonable, but the European contribution is likely too low (at least at JFJ). It is difficult to quantify the uncertainties associated to each process (e.g. stratospheric input, North American contribution). However, it is unlikely that the North American contribution could be twice as high as that reported in the paper. Auvray and Bey (2005) used the GEOS-CHEM model to simulate enhanced O₃ (i.e., over eastern North Atlantic and the free troposphere over Europe) which were found to be of North American origin. They found that the model reproduces observed O₃ concentrations by 10 ppb with a North American contribution of about 20 ppb.

“In section 4.1 the three different pathways of pollution transport from North America

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to Europe are listed i)-iii). It is not clear to the reader if this is a finding by the authors of the present paper or if it is a result according to Li et al. (2005a).”

It is rather a finding of this paper which also agrees with case studies found in previous works. We have cleared this point in the text.

“Instead essential information on every single LRT event could be summarised in a table (e.g. source region over North America, pathway over the North Atlantic in Con/Lat/Altitude, meridional/zonal transport, in WCB/ around Azores anticyclone, entering region Lat/Altitude over Europe).”

Following the Referee’s suggestion, we have included a table which summarises the nine LRT episodes in section 4.

“In section 6 (Summary and conclusions) almost the same text as in the abstract is repeated. This part should be rewritten and include more conclusions.”

This comment has been taken into account and both the summary and the conclusions have been revised accordingly.

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