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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Chinese SO_2 pollution over Europe – Part 1: Airborne trace gas measurements and source identification by particle dispersion model simulations" *by* V. Fiedler et al.

V. Fiedler et al.

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Author response to referee #2

First of all I would like to thank on behalf of all authors referee #2 for the really helpful instructions and comments. All comments will be taken into account for a revised version of the paper.

Concerning the origin of the SO2 pollution, the referee is right that the SO2/NOx ratio can't be used as single evidence for the origin of the SO2 pollution from a certain region. Anyhow the Flexpart results mainly point out regions in China as pollution source region and we wanted to show that the SO2/NOx ratio nicely fits in. The mean SO2/NOx in the Chinese region is 1.2 mol/mol, so most of the molar ratios that contributed from China were indeed bigger than 1. The mean SO2/NOx ratios for China, Korea and Japan will be added to Figure 7. The Flexpart source contribution from each country will be added to Figure 7 as well (the values are 1.5 ppbv for China, 0.1 ppbv for Korea and 0.2 ppbv for Japan). Considering the source contribution values for the different continents and the total source contribution, which all are given in Figure 6 c, we get the following percentage contributions of the different regions to the final Flexpart SO2 output: 90% of the SO2 stems from Asia, 5% from Europe and 5% from America, for Asia in detail: 71% were of Chinese, 10% of Japanese and 5% of Korean origin. The title and the text will be nevertheless changed to East Asian SO2 pollution, as it is right that the pollution is not 100% Chinese.

The DLR mission was not part of INTEX and also not of ICARTT, but of INTEX-B. This will be changed in the revised version. There now also exists a campaign overview paper from Singh et al. about INTEX-B, which has been published in ACPD on 7th of January this year after the submission of our paper and which also gives an overview on the DLR Falcon flights. We will cite this paper in our next paper version.

The summary of and the comparison to the paper Arnold et al. 1997 will be changed according to the referee's instructions.

The flight track in Figure 1 now shows the SO2 mole fraction as color code.

The comments of stylistic nature to the text and the figures will be applied as well.

ACPD

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