

Authors response on Interactive comment on “On the long term impact of emissions from central European cities on regional air-quality”
by P. Huszar et al.

The authors would like to thank for the review of the manuscript including valuable comments and corrections. Our responses follow one-by-one:

Reviewer #2

Reviewer's comment: The paper is well written, although a bit lengthy in the introduction and conclusions. I would recommend to move some of the discussion to the results section and reduce section 5 only to the main conclusions of the study and therefore gain some more space for the validation part to include maybe meteorology as an online-coupled model is used.

Authors' response: As already responded to reviewer #1, the choice of online-coupled modelling system was required as we were interested not only on the emission impact on air-quality (or chemistry in general) but also in the simultaneous radiative feedbacks and impact on temperature (or climate in general). In this paper, we presented the 'chemical' part of the results, including a 'chemical' validation. In a follow-up paper, the focus will be on climate impact, i.e. the meteorological feedbacks (through radiation) will be presented and that manuscript will contain also a detailed validation of the meteorological fields, like temperature, radiation, precipitation etc. Our manuscript is lengthy and would become even more if meteorological output would be validated as well. We rely on previous performances of RegCM used in our studies showing satisfactory reproduction of the mean state and variability of the atmosphere.

Reviewer's comment: One important technical comment is that the figure legends and axes would look much better and more readable if larger fonts are used.

Authors' response: We enlarged the legends and the numbers describing the colorbars which were too small in the original manuscript. The figures are now more readable, and if not, by zooming, more details appear, as they are saved and included in the manuscript in a high dpi (dots-per-inch).

Changes to the original manuscript: apart from minor corrections made following the reviewers comments, the most important changes include 1) splitting the last section into two separated: Discussion, and, Conclusions. 2) additional explanation of the biases encountered in case of ozone, and its connection to NO₂ biases, included in the Discussion part. 3) enlarging fonts in the figures where it was necessary.