

Interactive comment on “Regional and seasonal radiative forcing by perturbations to aerosol and ozone precursor emissions” by Nicolas Bellouin et al.

Anonymous Referee #2

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This paper documents the results of a collection of experiments aimed at identifying the forcing associated with regional perturbations of emissions. It does so using a collection of 4 models, with varying degrees of complexity on chemistry and aerosol representation, amongst other sources of differences. This is a timely paper, focusing on policy-relevant questions.

Main comment

While I find the scientific approach interesting and worthwhile, I find the paper in this present form to be quite limited. It reads mostly as a report, with considerable discussion of all findings, but little added understanding or combined pieces of information. More specifically, the paper is too long and should focus much more on summaries

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(such Figure 12) than the description of each aspect and model results separately. This is because models are different (see for example the discussion on page 13, lines 1-15) and so give different forcings, but the paper only describes differences (as it is explicitly noted on Page 15, lines 30 and 31 and Page 16 lines 1-3). I think that the authors should focus on the important information that comes out of their analysis, and put all the more detailed discussion into the supplement. This will make the paper much more readable and useful, the way Shindell and Faluvegi has been.

Minor comments

Page 5, lines 22-25: since several forcings have negative forcings, it would be better to list the ones with the positive forcings instead of using "All ..."
Page 12, lines 13-19: this definition would not be sufficient for computing R_{Fac} (see Ghan, 2013; <http://www.atmos-chem-phys.net/13/9971/2013>)
Page 23, lines 26-27: this kind of comment has to be substantiated. Similarly, Page 25, lines 16-18.

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