We thank all the reviewers for helpful comments that will improve our manuscript. Our responses are given in red.

Anonymous Referee #1

Received and published: 16 April 2017

The paper presents estimates of regional temperature change in latitude bands from regional emissions of several different short-lived climate forcers based on radiative forcing calculations and regional climate sensitivities from litterature. The paper is well presented and the results are useful for first order assessment of the climate impacts of different mitigation strategies for air pollutants. The paper merits publication in ACP after considering the following comments.

Section 3.4 summarizes different uncertainties. It would be useful if the authors could extend the section to include also a discussion of what research that is most urgently needed to reduce the uncertainties in the methodology used.

This is an important comment. We have added a paragraph of what research we would like to be done to improve the results:

"More research is warranted to improve the temperature estimates and to reduce uncertainties. As the forcing-response coefficients (RCS) come mainly from one model, research is most needed to test the robustness of those model results, preferably in a multimodel intercomparison framework. We would also like to encourage work on how the temporal temperature response varies between the different latitude bands and species. As new data on RF from more and smaller emission regions are published in the future, and if RCS values become available for additional forcing and response regions, our study could be extended with this improved data."

p9 l319 replace of with on

Corrected.

p10 l337 suggest "more detailed estimates for"

Accepted.

p11 l370-371 check language

We have clarified by stating "summer emissions" rather than "summer" and the same for winter. We have also changed the start of the sentence from "the temporal variability shows" to "the results show".