

## ***Interactive comment on “Air quality in the eastern United States and Eastern Canada for 1990–2015: 25 years of change in response to emission reductions of SO<sub>2</sub> and NO<sub>x</sub> in the region” by Jian Feng et al.***

**Jian Feng et al.**

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### **Reply to the comments and suggestions of Reviewer #2 (Tom Butler)**

First, we would like to thank Tom Butler (the reviewer) sincerely for his very detailed, thoughtful and constructive review and comments. It helps to improve the quality of the manuscript significantly.

Answers to specific comments:

C1

Comments 1-7: We have revised the manuscript accordingly.

Comment 8: We agree with the reviewer that the Section 3.2 has too much detail on the description of year-to-year variations. We have done significant revisions to remove and skip the minor changes that don't address the overall patterns. We are very appreciate of the reviewer's suggestions.

Comments 9-18: We have revised the manuscript accordingly.

Comment 19: We agree that the original texts are not very clear, and can cause confusion to readers. We have revised the text to indicate that the correlations between SO<sub>4</sub> and SO<sub>2</sub> can be described by linear regressions for 1990-2010 and 2010-2016 respectively, but the correlation between SO<sub>4</sub> and SO<sub>2</sub> for the whole study period of 1990-2016 needs to be described by a power-law regression. This helps to explain why in the past some studies suggest that the relationship between SO<sub>4</sub> and SO<sub>2</sub> be linear, while others suggest that it be a power-law relationship.

Comments 20-29: We have revised the manuscript according to the suggestions.

Comment 30: We tried to combine the 2nd and 3rd graphs into one, but the lines cross over each other, and it is difficult to see each line, so we leave 2nd and 3rd graphs as separate ones.

General comments: We have taken the suggestions of the reviewer, and rounded up some percentage numbers with decimals to integers.

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Please also note the supplement to this comment:  
<https://www.atmos-chem-phys-discuss.net/acp-2019-567/acp-2019-567-AC2-supplement.pdf>

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