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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Aura OMI observations of regional SO_2 and NO_2 pollution changes from 2005 to 2014" *by* N. A. Krotkov et al.

Anonymous Referee #2

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General comments

The paper deals with changes in NO2 and SO2 levels in several regions using satellite-based observations. It includes accurate reference to different emission sources and processes corresponding to different industrial and other human-related activities. The authors present also interesting information on the ratio between SO2 and NO2 content with interesting discussion about the changes in political and economical conditions. The paper is well written and the methodology appropriate. I recommend publication on ACP after addressing the following minor comments.

Specific comments

1) Section 2.3 You mention you select only clear sky conditions. Could you comment

if/how this could affect your results?

2) P26567 L3 Schmidt et al. 2015 recently found that SO2 emissions during Holuhraun volcanic eruption in September 2014 exceeded SO2 emissions from all anthropogenic sources in Europe. Did you find any signature of this in your analysis?

3) P26569 L26-28 Here and in general elsewhere in the text: it is mentioned that trends in OMI columns match trends reported in emissions: I think should be at least roughly quantified. For example, what would be the expected reduction in SO2 columns corresponding to the observed emission reduction in eastern US? Please check this for other regions too (if relevant).

4) P26572 L4 “SO2 reduction” maybe should be specified reduction of what, e.g. emissions.

5) P26572 L6 “OMI detection limit” maybe you could remind the value here

6) P26573 L8-9 I think there is need for a reference here concerning the emission distribution.

Technical corrections

1) Fig. 3 and elsewhere is there a reason you use DU and molec./cm2 for SO2 and NO2, respectively? Why not just use molec./cm2 for both?

2) Fig. 4-7 The panels are quite small and a colorbar for each panel is not necessary. Could the colorbar be moved to the right side (vertical) of each row? So only 1 colorbar for 3 panels.

Schmidt, A., et al. (2015), Satellite detection, long-range transport, and air quality impacts of volcanic sulfur dioxide from the 2014–2015 flood lava eruption at BárÃřarbunga (Iceland). J. Geophys. Res. Atmos., 120, doi:10.1002/2015JD023638.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 26555, 2015.