

Reviewer #1

The authors made good efforts to address the referees' comments. Here are a few more minor comments.

Thank you for your careful re-review. The additional text added has been *italicized*.

The revision has "Here, we visually inspect the plume to ensure that the NO₂ effective lifetime is reasonable given the plume decay before proceeding", and the response has "When the EMG fit does not show an appropriate NO₂ lifetime, we do not report the results". I suggest make it less subjective by quantifying boundaries, i.e., how long is considered "reasonable" or "appropriate".

Modified to, "Here, we visually inspect the plume to ensure that the NO₂ effective lifetime is reasonable (*generally between 0.5 – 5 hours*) given the plume decay before proceeding."

"Section 2.2.2 of the revised manuscript, slant column observed by a satellite should be the amount from the sun to the detector, not from surface to the detector. That part can be just removed.

The phrase, "representing the amount of HCHO between the surface and detector" was removed as suggested.

"Page 8, line 24, "The fluxes can then be multiplied by the urban area to get emission rates". Strictly, this should be a 2D integration.

Modified to, "The fluxes can then be *integrated across* the 2-D urban area to get emission rates in analogous units as Equation 2."

Page 8, line 30, "The central 250 pixels (out of 450)". The same argument can be applied to NO₂, but all NO₂ across-track positions are used. Is it more critical to only use the swath center for HCHO? Is there a reference for such filtering?

We found it to be critical for this particular method as we currently state in the text. It wasn't critical for the other uses of the TROPOMI NO₂ data.

Page 16, line 15 of the revised manuscript, "evaluating the NO₂ from power plants and the NO_x/NO₂ ratio as the plume involves". Should "involves" be "evolves"?

Good catch. Modified from "involves" to "evolves"

Page 19, line 12-13, it may be a stretch to say EMG and flux divergence are "consistent" when one biases low by 65%. Consider rephrasing it or adding some discussion.

Thank you for pointing this out. Yes, there is still disagreement between methods at the power plant location. Modified to, "The results from the flux divergence method are consistent with the results from the EMG method *in the Dallas area* provided that a short NO₂ lifetime is assumed."

Reviewer #2

The authors have well addressed reviewers' comments. Great job!