

Atmos. Chem. Phys. Discuss., referee comment RC2 https://doi.org/10.5194/acp-2021-730-RC2, 2021 © Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.

Comment on acp-2021-730

Anonymous Referee #2

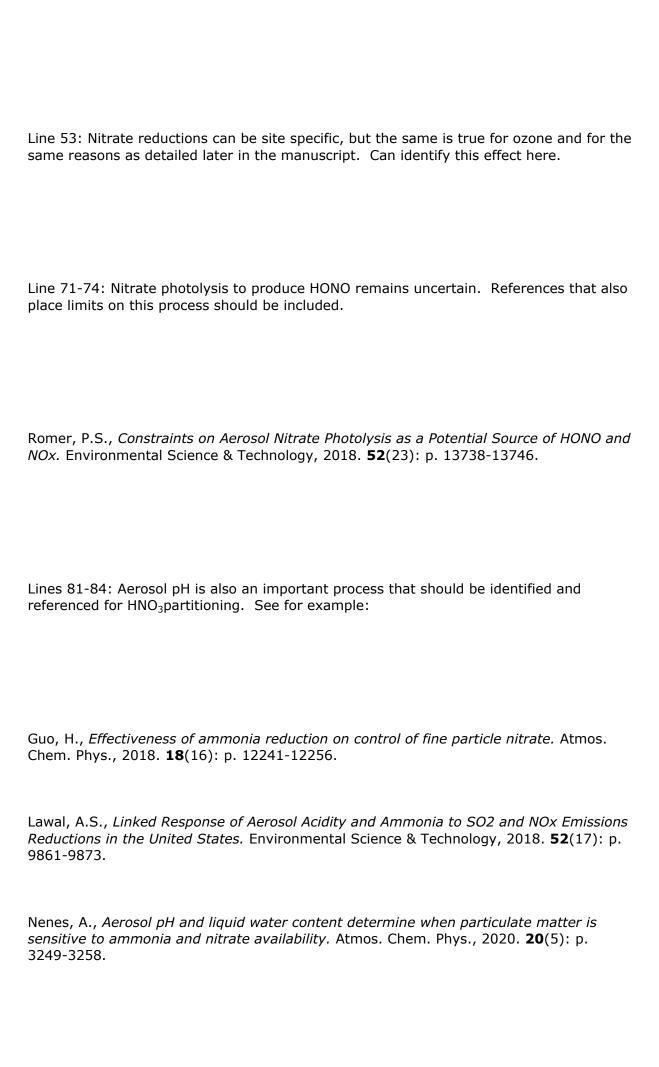
Referee comment on "The formation and mitigation of nitrate pollution: comparison between urban and suburban environments" by Suxia Yang et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2021-730-RC2, 2021

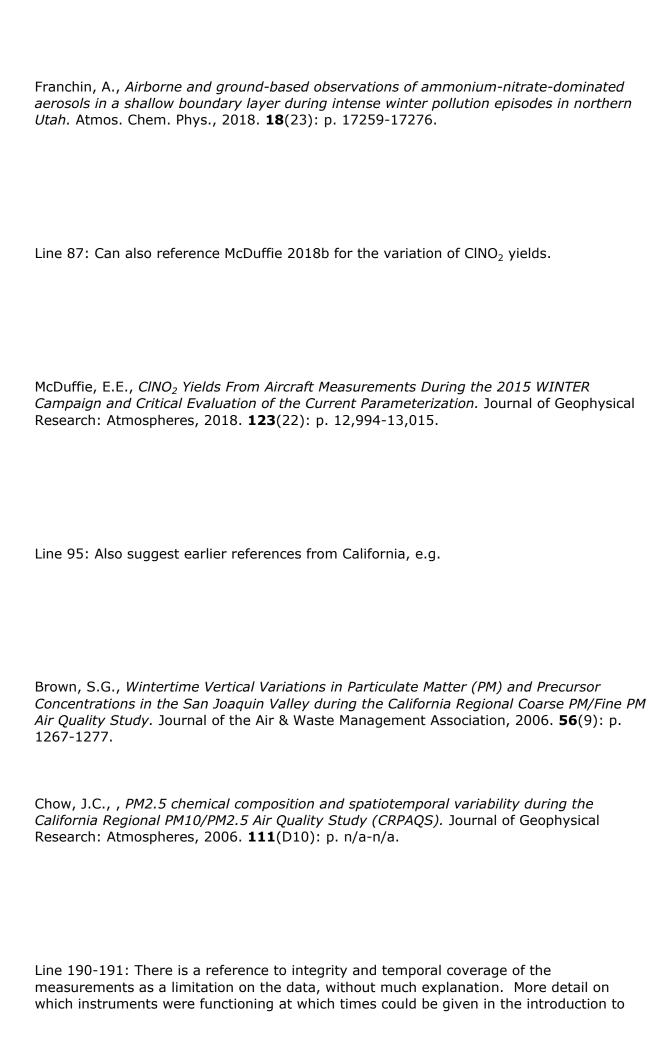
General comments

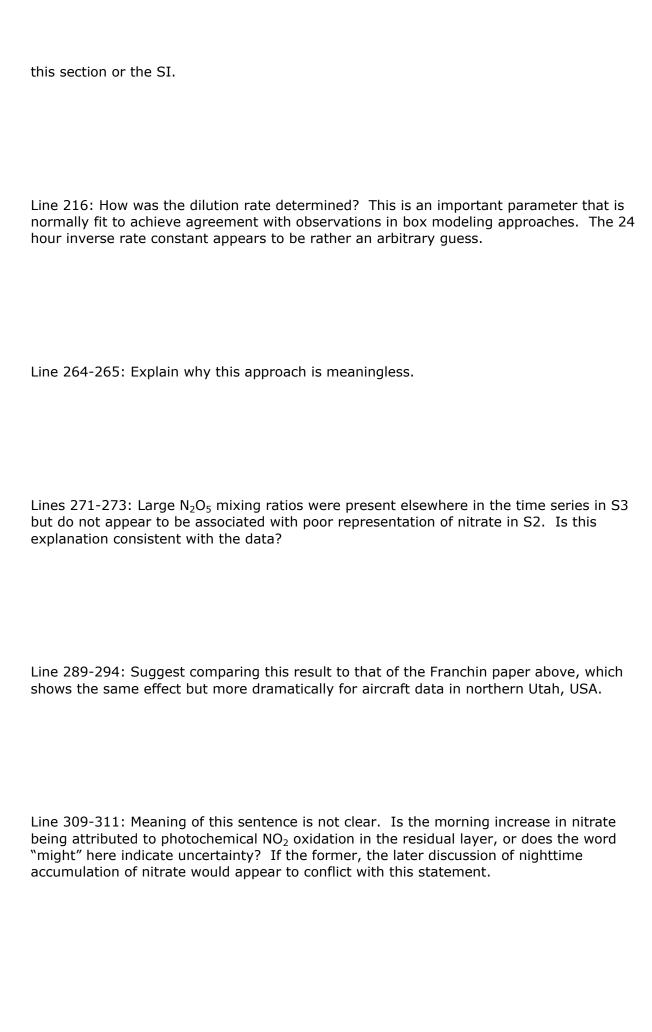
Yang et al. analyze data from several sites in the Pearl River Delta to assess mechanisms for the production of nitrate aerosol, an increasingly important component of $PM_{2.5}$ pollution in China. The analysis shows that the contribution of photochemical and dark mechanisms varies by site and depends on both the chemistry and the dynamics of the planetary boundary layer. It further shows that NO_x reductions are unlikely to improve nitrate pollution despite being the major precursor due to the dependence of NO_x oxidation rates on NO_x itself. Reductions in VOCs, by contrast, are effective at all sites in both NO_x and O_3 reductions.

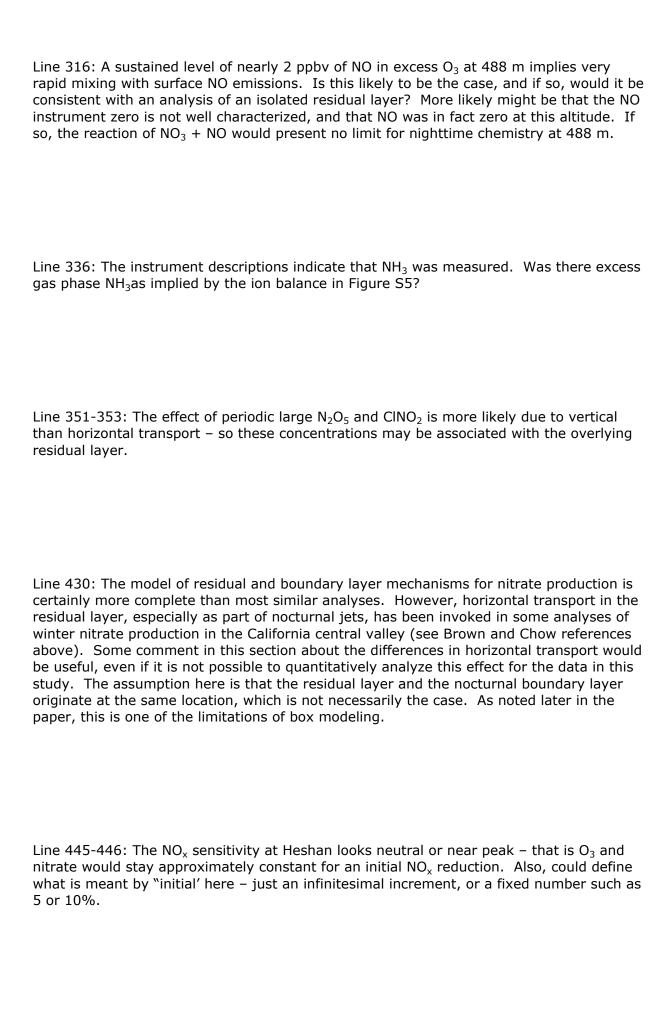
The paper is well written, easy to follow and well organized. It is of substantial interest to the readership of ACP. I recommend publication following attention to the specific comments below.

Specific comments









Supplement, lines 135-138: The sensitivity to the CINO ₂ yield is explored, but not the
N_2O_5 uptake coefficient. Can the authors comment on the sensitivity to this parameter?
Importantly, there may be almost no sensitivity here if the system is limited by the
reaction of $NO_2 + O_3$. If so, the N_2O_5 uptake coefficient would need to be reduced
substantially before the heterogeneous reaction becomes important or rate limiting. Can
the authors comment on these aspects of the model sensitivity?



Line 43: replace "are" with "is an"

Line 62: hygroscopic properties

Line 231: particle rather than particles

Line 365-367: Check sentence grammar

Line 399-400: Check meaning – what is "nitrate of nitrate"