The manuscript titled "Investigation of the atmospheric nitrous acid (HONO) process in South Korea" by Kiyeon Kim et al. examined the contribution of various sources to HONO formation through detailed model simulations. Additionally, the study also investigated the impact of HONO processes on atmospheric species such as OH, HO_2, HCHO, and O_3 etc. Overall, the manuscript is well-written and organized; however, there are several questions that need to be addressed before it can be published.

1. Line 345:

The author suggested that the WRF model exhibits a pronounced inclination to generate higher wind speeds compared to actual measurements, which may result in an underestimation of air pollutant concentrations. If this assertion holds true, it is reasonable to assume that such underestimations would also occur during other periods. Could you provide further clarification or explanations regarding the underestimation observed during stagnant periods?

2. In EXP 2, the authors assess the impact of biomass burning on HONO emissions. It is acknowledged that there is no significant biomass burning occurring during this period, thus the direct contribution of biomass burning can be considered negligible. However, has the author taken into account the potential secondary formation from these sources? For instance, recent studies have reported an increased formation of HONO in the presence of nitrate and organics (e.g., photosensitizer) under irradiation (Jiang et al., 2023; Wang et al., 2021), which could be emitted from biomass burning. Furthermore, it has also been documented that HONO generation can occur through reactions between nitrate and Fe(II) promoted by photolysis of Iron-organic complexes (Gen et al., 2021). Considering that all these components may originate from biomass burning, it would be worthwhile to investigate the influence of these secondary reactions on HONO formation.

3. Line 376-377:

Are there any specific reasons why the soil emissions of HONO are not considered significant in South Korea?

4. Line 378-380:

Have the authors conducted any sensitivity tests, such as investigating the impact of an increased uptake coefficient of NO_2 on heterogeneous NO_2 reactions and subsequent HONO formation?

5. Figure 3:

During the daytime, there is an underestimation of HONO levels even when considering all potential sources. However, an overestimation is observed from 0 am to 6 am when incorporating HET-BD and RENOx. Does this imply the presence of missing sinks for HONO during nighttime? In theory, photolytic renoxification of nitrate should only occur in the presence of irradiation; however, there is an increased concentration of HONO even at night (0 am - 6 am) when including RENOx in the model simulation. Any suggestions on it?

6. Line 442:

It is noteworthy that traffic emissions make a substantial contribution to the overall production of HONO during nighttime. One might assume that traffic would be less prevalent at night compared to daytime. I am curious about how one can differentiate between direct emissions of HONO from traffic and indirect sources, such as NOx emitted from traffic that undergoes further reactions to generate HONO.

7. Line 503-505:

The limited contribution of the $NO_2 + H_2O \Rightarrow HONO + NO_3^-$ reaction to HONO formation suggests that its impact on nitrate production is likely negligible, correct? Has the author conducted model simulations to assess its contribution to nitrate?

Reference:

(1) Jiang, H.; Bao, F.; Wang, J.; Chen, J.; Zhu, Y.; Huang, D.; Chen, C.; Zhao, J., Direct Formation of Electronic Excited NO2 Contributes to the High Yield of HONO during Photosensitized Renoxification. *Environmental Science & Technology* **2023**.

(2) Wang, Y.; Huang, D. D.; Huang, W.; Liu, B.; Chen, Q.; Huang, R.; Gen, M.; Mabato, B. R. G.; Chan, C. K.; Li, X.; Hao, T.; Tan, Y.; Hoi, K. I.; Mok, K. M.; Li, Y. J., Enhanced Nitrite Production from the Aqueous Photolysis of Nitrate in the Presence of Vanillic Acid and Implications for the Roles of Light-Absorbing Organics. *Environmental Science & Technology* **2021,** *55* (23), 15694-15704.

(3) Gen, M.; Zhang, R.; Chan, C. K., Nitrite/Nitrous Acid Generation from the Reaction of Nitrate and Fe (II) Promoted by Photolysis of Iron–Organic Complexes. *Environmental science & technology* **2021,** *55* (23), 15715-15723.