

Interactive comment on “Significant contribution of HONO to secondary pollutants during a severe winter pollution event in southern China” by Xiao Fu et al.

Anonymous Referee #2

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Summary: The authors present results from a modelling study on sources of nitrous acid during a large pollution event in the Pearl River Delta, China. The CMAQ model was updated with 4 new HONO sources, based on previous lab and field studies. The modelled HONO was compared to observations and was shown to agree well when the additional sources were included. The authors also discuss the impact of the high HONO observed on the oxidation capacity of the atmosphere. The manuscript is well written and the work is important for future modelling studies of HONO sources. I recommend this manuscript for publication once the following comments have been addressed.

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1. L202-212: In agreement with Referee 1, further information on the accuracy of the measurements used in this study is required. Additionally, information on the location of the instruments, i.e. how far above ground level were they located, would be useful.
2. L218: It is not clear from the reference provided how the NO₂ were adjusted to correct for interference. Suggest including a brief sentence or two describing the adjustments made, either in the main text or supplementary material.
3. L245-247: I am unsure as to whether the re-release of HONO from the evaporation of dew water could account for the large differences between modelled and measured HONO in the early morning. Could you estimate the HONO released from dew using the method discussed in He et al, (2006), to determine the potential contribution from this source. For example, on 5 January the model underestimates the HONO morning peak by approximately 3 ppb (based on Fig 2). Could re-release from dew be such a large contributing source? If so, this is an important observation.
4. Suggest making the legends in Figures 3 and 5 larger as they are difficult to read.

References: He, Y., Zhou, X. L., Hou, J., Gao, H. L., and Bertman, S. B.: Importance of dew in controlling the air-surface exchange of HONO in rural forested environments, *Geophysical Research Letters*, 2006.

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