NH$_3$-promoted hydrolysis of NO$_2$ induces explosive growth in HONO

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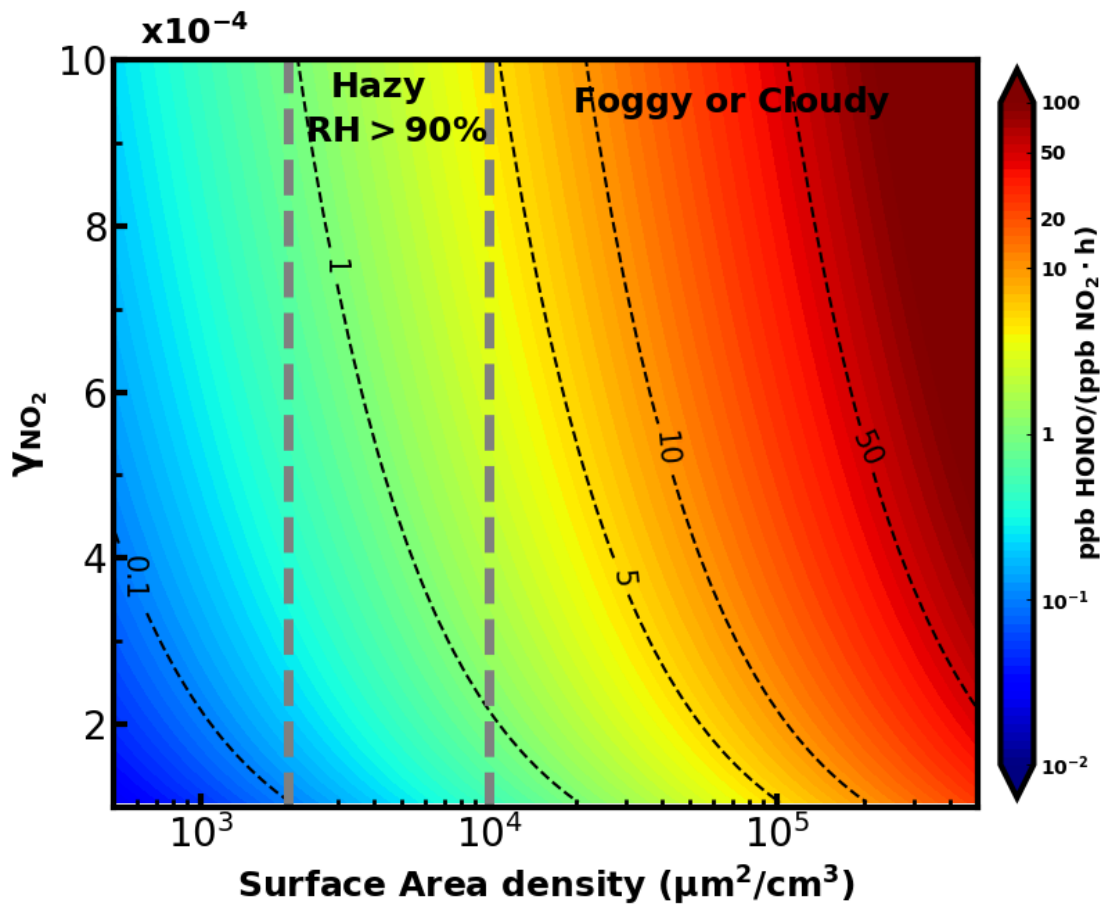
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19 **Figure S1.** The production rate of HONO under different conditions and with different values of reactive

20 NO₂ uptake coefficients (γ_{NO_2}), the γ_{NO_2} range is from Li et al. (2018). The surface area density range of

21 fog is calculated based on the fog droplet size distribution measured on the North China Plain (Shen et

22 al.).

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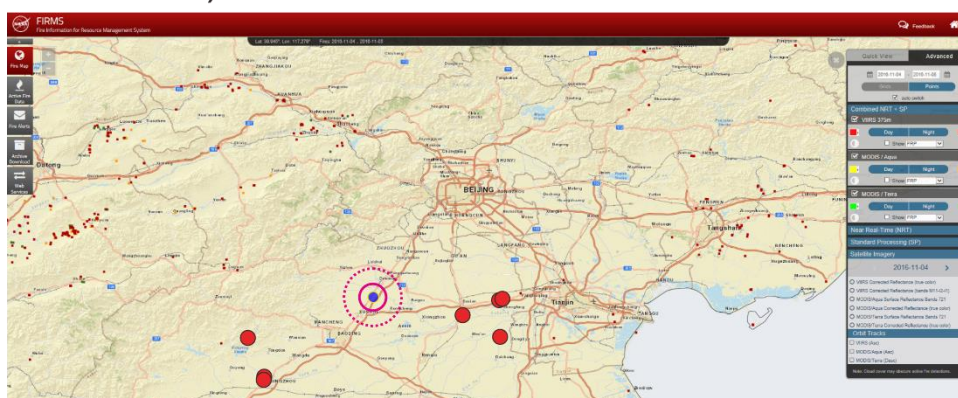
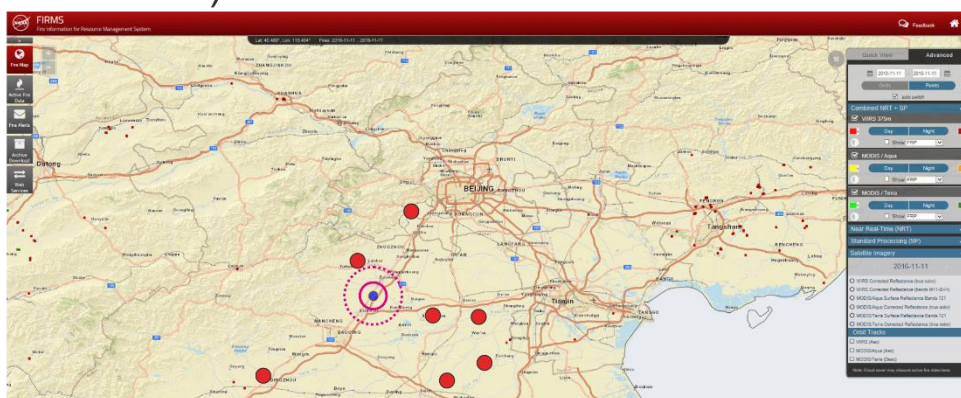
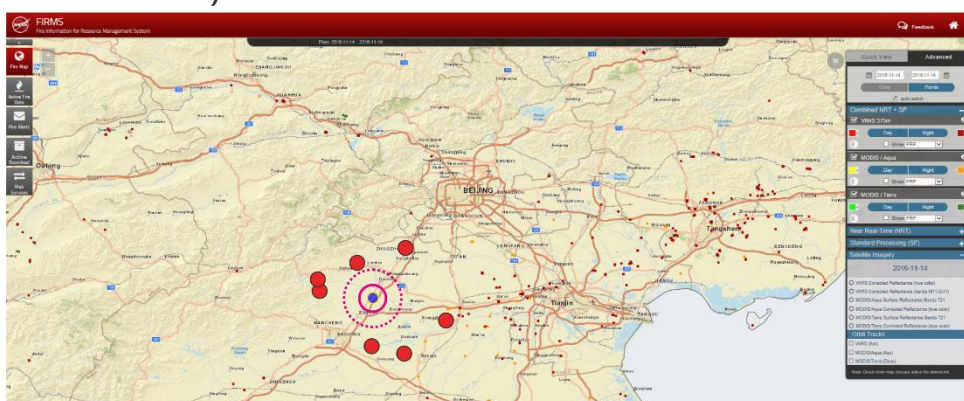
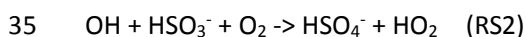
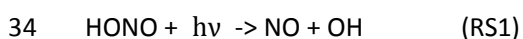


Figure S2. Fire spots maps (large red dots: fire spots closest to the station, bright and red dots: VIIRS, yellow and orange dots: MODIS Aqua, bright and dark green dots: MODIS Terra) produced by NASA's Web Fire Mapper (https://firms.modaps. eosdis. nasa.gov/firemap/), respectively for the 4th-5th, 11th and 14th Nov. 2016. The blue dot shows the location of the Gucheng site, while the pink solid and dashed line circles respectively cover areas within 10 and 20 km distance.

Indirect oxidation of S(IV) by HONO:

HONO + $h\nu$ -> NO + OH   (RS1)

OH + HSO_3^- + O_2 -> HSO_4^- + HO_2 (RS2)

36     $OH + RH + O_2 \rightarrow RO_x + HO_2$ (RS3)

37     $HO_2 + NO \rightarrow NO_2 + OH$ (RS4)

38     $HO_2 + HO_2 \rightarrow H_2O_2 + O_2$ (RS5)

39     $HSO_3^- + H_2O_2 \rightarrow HSO_4^- + H_2O$ (RS6)

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