

## ***Interactive comment on “Nitrate-driven haze pollution during summertime over the North China Plain” by Haiyan Li et al.***

**Anonymous Referee #2**

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The authors investigated the sources and evolution processes of nitrate-driven haze pollution during summertime over the North China Plain. They performed field studies in two cities, and used source characterization technique and thermodynamic equilibrium model to analyze the data they achieved. The results highlight the significant role of nighttime chemistry plays in nitrate aerosol formation, and examine the influence of ammonia emissions and regional transport on nitrate yields. The work is within the scope of ACP and could be published after the following issues are addressed.

1. Page 1, line 21: Not clear what “linearly increased contribution” means.
2. Page 1, lines 24–26: The authors list four factors that influence nitrate aerosol formation, which appear equally important to readers. The text should be more precise about the main findings of this study.

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3. Page 5, line 178: As we focus on nitrate aerosol in this study, please put nitrate at the bottom of Figure 3 to highlight the increased contribution with elevated PM<sub>1</sub>.
4. Page 5, line 188: In Figure 4, the confidence interval for the slope are all zero. Check if it is correct or not.
5. Page 6, lines 217–218: “At a sulfate concentration from 0.1 to 45  $\mu\text{g m}^{-3}$ , a 10  $\mu\text{g m}^{-3}$  increase of gaseous NH<sub>3</sub> generally results in an enhancement of  $\varepsilon(\text{NO}_3^-)$  by over 0.1 units” From Figure 6, I won’t say that the gaseous NH<sub>3</sub> and  $\varepsilon(\text{NO}_3^-)$  are linearly related. Please reorganize the sentence to be more clear and precise.
6. Page 7, lines 229–234: Sentences are not connected well. A more complete discussion of the influence of sulfate aerosol and gaseous NH<sub>3</sub> is needed in the paper.
7. Page 7, line 260: Not clear what each colour represents in Figure 8.
8. Page 8, Section 3.4: Though this section contains links to policy implications, the discussion is very limited with only few sentences. The authors should attempt to rebalance the text in Section 3.4.
9. Page 8, Section 3.4: In Figures 9 and 10, the measurement results of this study should also be added to compare with other data. Explain what the areas of shaded regions in Figure 10 mean.
10. Page 8, Section 4: The conclusion part should be rewritten to compress text and focus on the main findings of this study. Now this section repeats the same text just as it presented above. For example, the lines 294–296 are exactly the same as lines 150–151.

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