

## ***Interactive comment on “Sources of reactive nitrogen in marine aerosol over the Northwest Pacific Ocean in spring” by Li Luo et al.***

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This study presents measurements of concentrations of water-soluble total nitrogen (WSTN), nitrate (NO<sub>3</sub><sup>-</sup>) and ammonium (NH<sub>4</sub><sup>+</sup>), as well as the stable nitrogen isotopes of  $\delta^{15}\text{N}$ -WSTN and  $\delta^{15}\text{N}$ -NO<sub>3</sub><sup>-</sup> in marine aerosols sampled over the East China Seas (ECSs) and Northwest Pacific Ocean in spring 2014 and 2015. Dissolve organic nitrogen (DON) and  $\delta^{15}\text{N}$ -DON were also analyzed in surface sea water (SSW) in the spring of 2015. The highest concentrations of water-soluble nitrogen species were found in aerosol sampled in the ECSs, which suggests that anthropogenic emissions are a significant source of aerosol reactive nitrogen. The nitrogen species and isotopic compositions suggest that aerosol  $\delta^{15}\text{N}$ -WSTN values are mediated synergistically by the occupations of NO<sub>3</sub><sup>-</sup>, NH<sub>4</sub><sup>+</sup> and water-soluble organic nitrogen (WSON) to WSTN

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with their  $\delta^{15}\text{N}$  in our observations. Meanwhile, our isotope mixing model indicates that DON in SSW is likely a source of primary WSON in aerosol, especially over the open ocean.

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