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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 (NO3-) and ammonium (NH4+), as well as the stable nitrogen isotopes of δ15N-WSTN and δ15N-NO3- in marine aerosols sampled over the East China Seas (ECSs) and Northwest Pacific Ocean in spring 2014 and 2015. Dissolve organic nitrogen (DON) and δ15N-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 δ15N-WSTN values are mediated synergistically by the occupations of NO3-, NH4+ and water-soluble organic nitrogen (WSON) to WSTN

with their δ15N 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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