

Isotopic investigation of dry and wet nitrogen deposition in Hong Kong

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Atmospheric N deposition is a non-negligible source of nutrient supply from the land to coastal waters. Precipitation and dry deposition were collected from June 2018 to October 2019 in Hong Kong to estimate the inorganic nitrogen flux to Hong Kong coastal waters. $\delta^{15}\text{N}$ and $\delta^{18}\text{O}$ of nitrate of rain samples were analyzed to trace the potential sources of atmospheric nitrogen. The $\delta^{15}\text{N}$ of NO_3^- in rain ranged from -4.1‰ to +3.0‰. The low $\delta^{15}\text{N}$ and high NO_3^- concentration from the air masses originating from the continent suggested a dominant influence of local gasoline and diesel combustion from Hong Kong and/or Shenzhen. The $\delta^{18}\text{O}$ of NO_3^- varied from +38.4‰ to +77.4‰ with spring being the highest. $\delta^{18}\text{O}$ appears to be mainly controlled by variations in the chemical oxidation pathway in the atmosphere.

We will also present carbon, nitrogen and sulfur isotopes of dry deposition coupled with back trajectory of air masses to further constraint the yearly dynamic of sources of atmospheric deposition in Hong Kong.

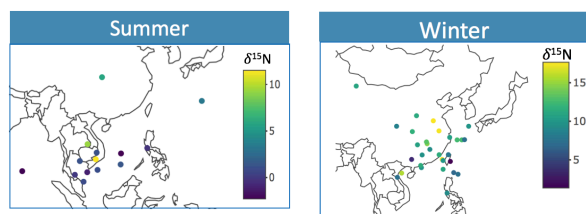


Figure 1: The origin of air mass for our dry deposition samples with their $\delta^{15}\text{N}$. Winter has a higher $\delta^{15}\text{N}$ value (+10.7‰) which can be attributed by the coal combustion in northern China, whereas lower $\delta^{15}\text{N}$ value (+2.1‰) was observed in summer which may due to the natural sources such as dust and lightning.