

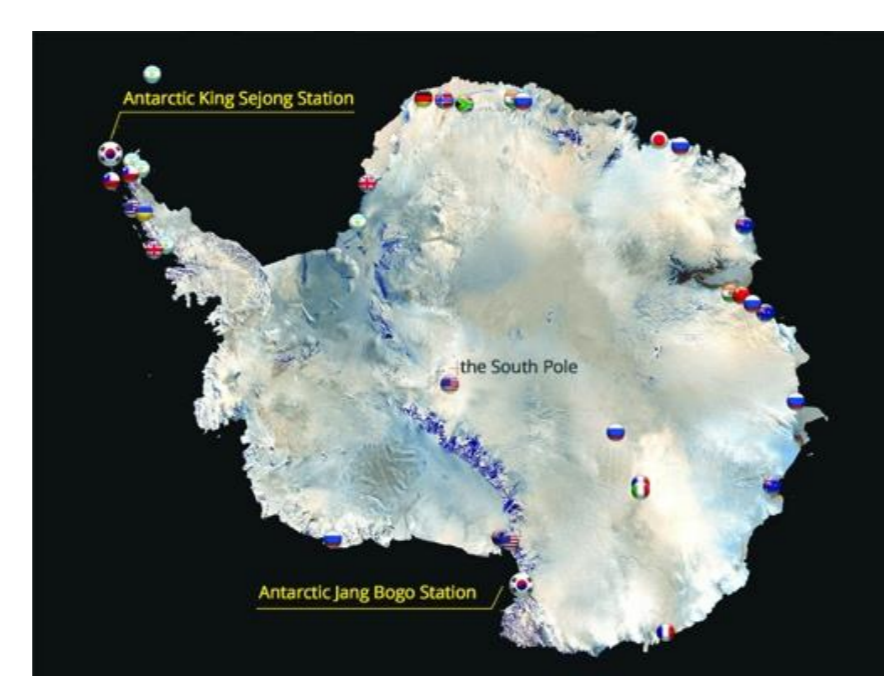
Caratterizzazione chimica dell'aerosol atmosferico a King Sejong station (Penisola Antartica)

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King Sejong Station



King Sejong Station (Antarctic Peninsula, 62° 13' S, 58° 47' W): permanent research station for KOPRI (Korean Polar Research Institute) since 1988

Aerosol sampling carried out all year-round from January 2013 to January 2014



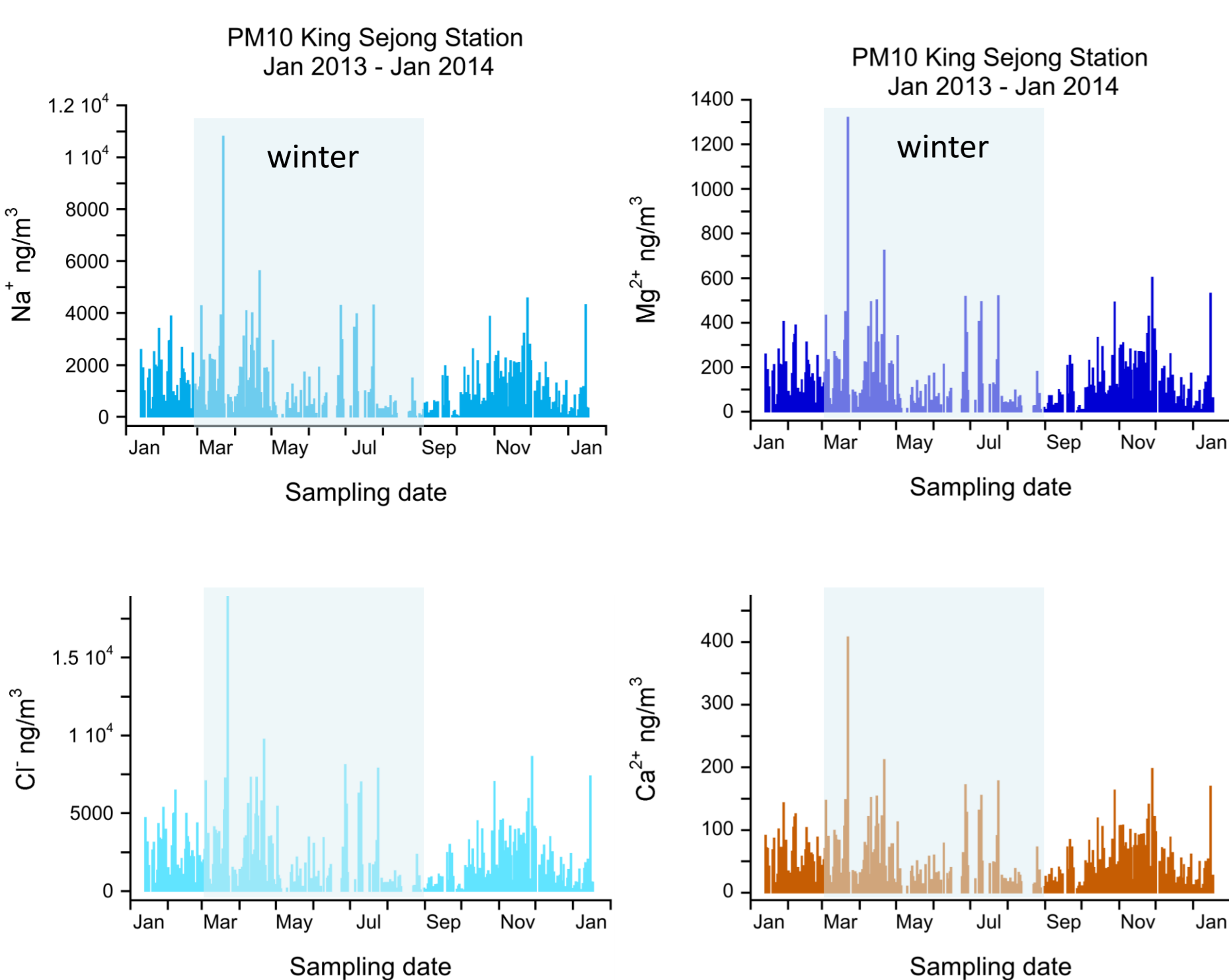
1. Daily PM10 for ion content (Ion Chromatography) on PTFE filter and EC/OC (Thermo-optical Analyser) on Quartz filter
2. 4-day multi-stage impactor (4-stages from < 1 μm to > 10 μm) for ion content and metals



Winterovering personnel and penguins coming home ☺

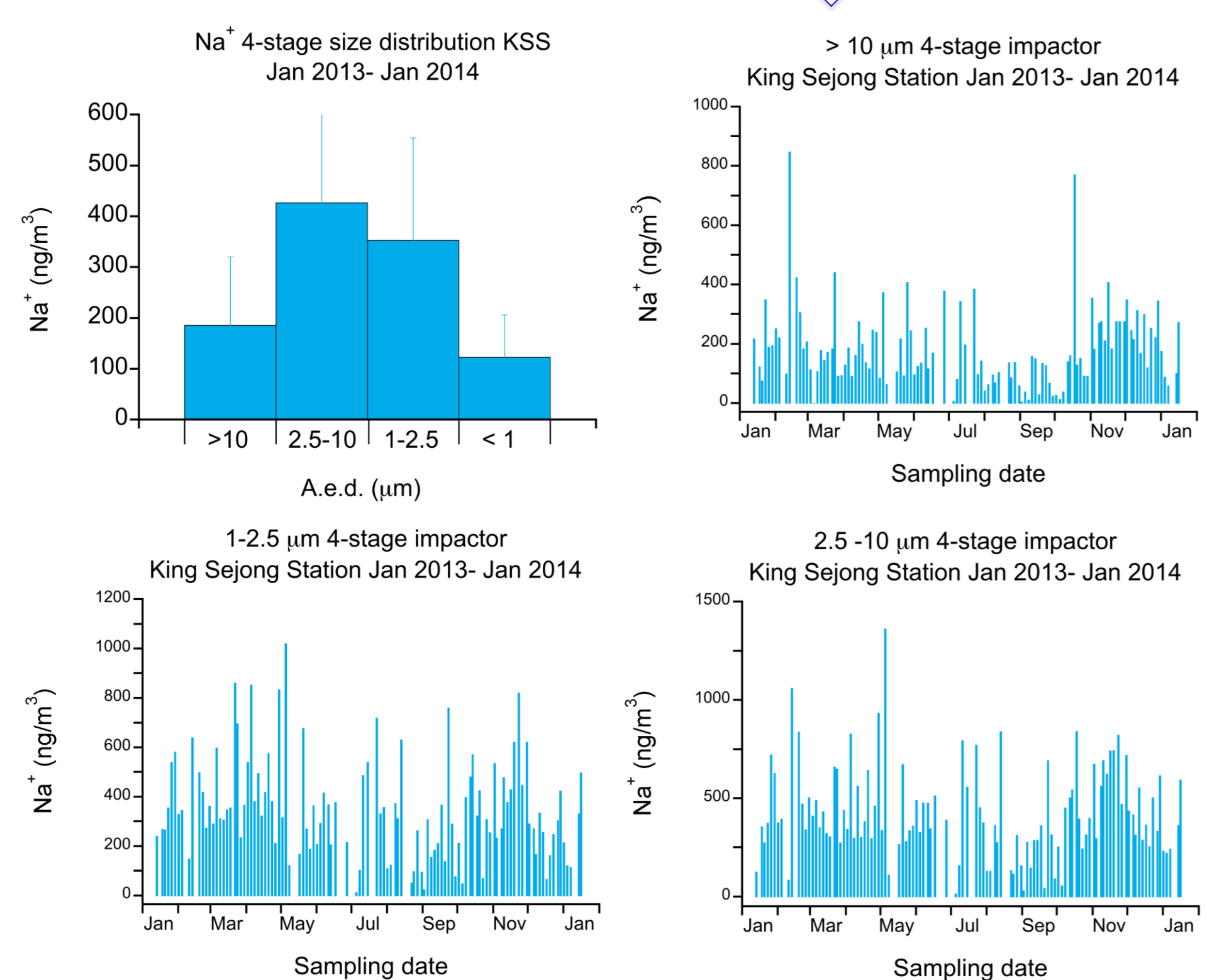
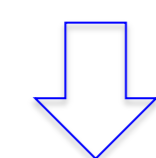


Primary marine aerosol

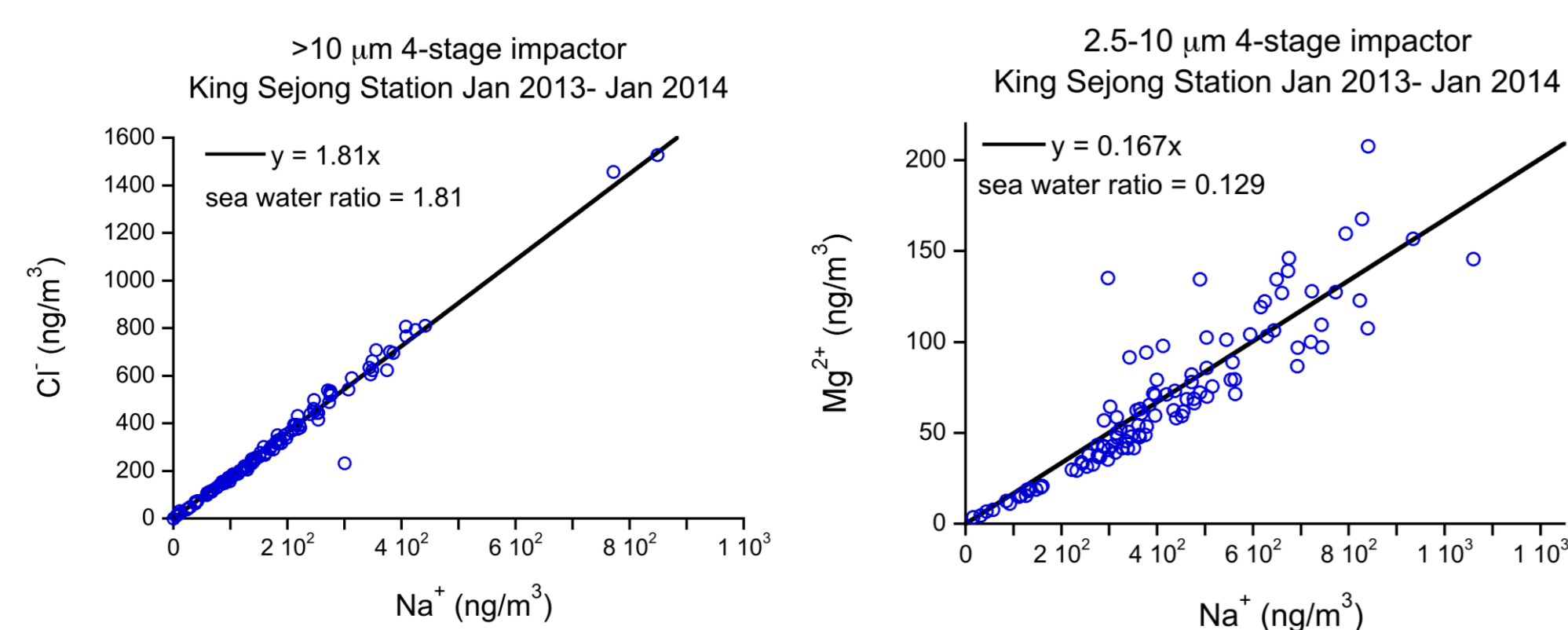


Not well marked seasonal pattern (very close to the coastline) of Na⁺ in PM10: higher background values during austral summer and larger occurrence of spikes during winter.

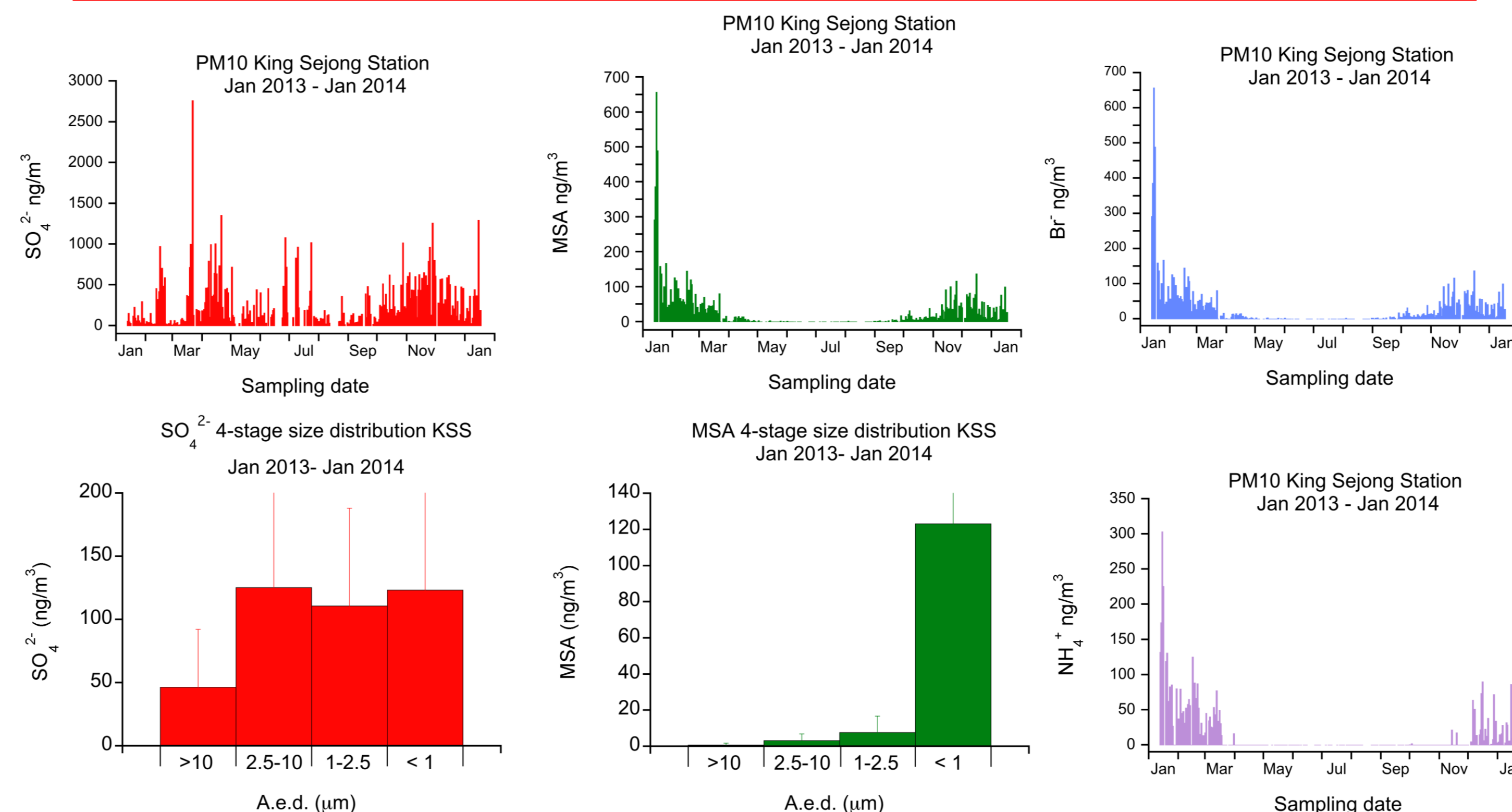
Sea spray mainly belongs to the coarse fractions below 10 μm, showing no clear seasonal variability (sea salt is supplied to KSS all through the year constantly)



Very good linear relationships between the sea spray markers



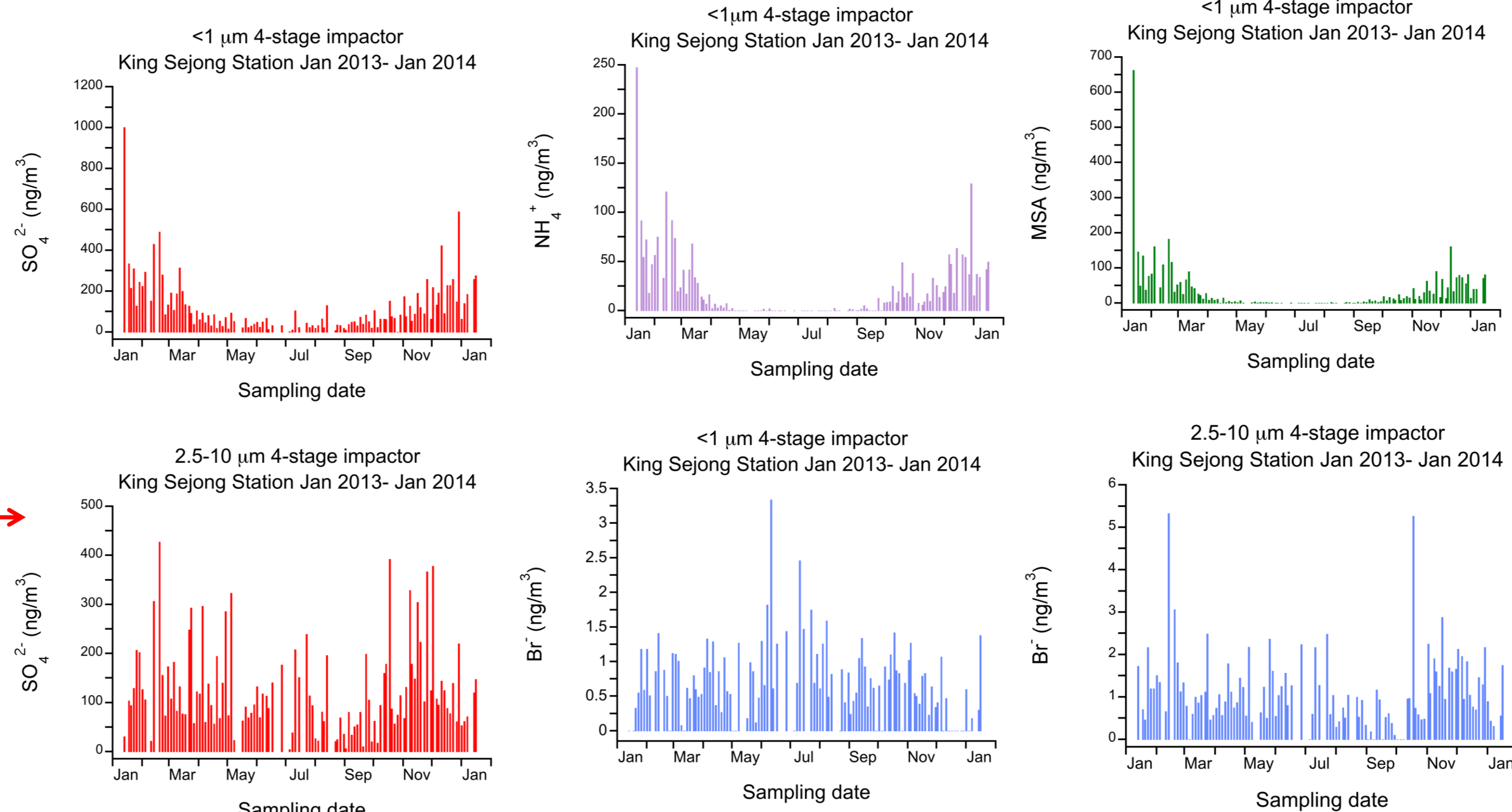
Marine biogenic aerosol



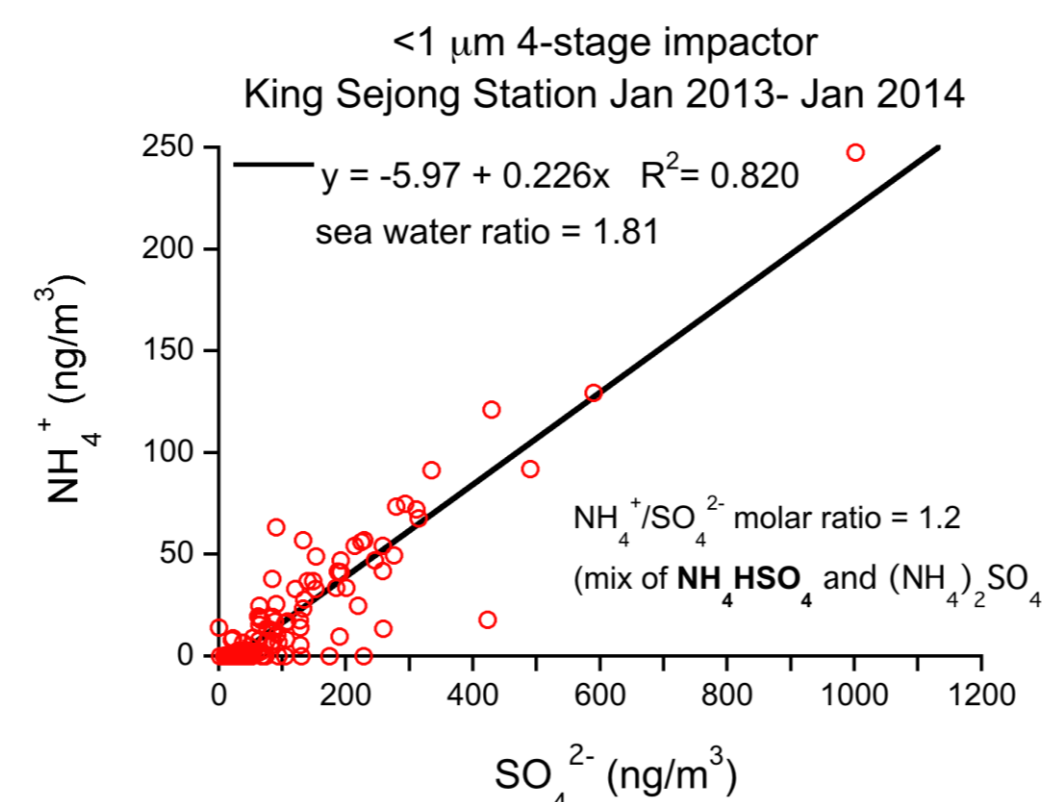
Sulphate is arising from both sea spray and marine biogenic activity, as shown by size distribution (bimodal in the coarse and submicron size classes)

MSA, Ammonium (and likely Bromide) are produced by marine biogenic activity and show distinct summer maxima.

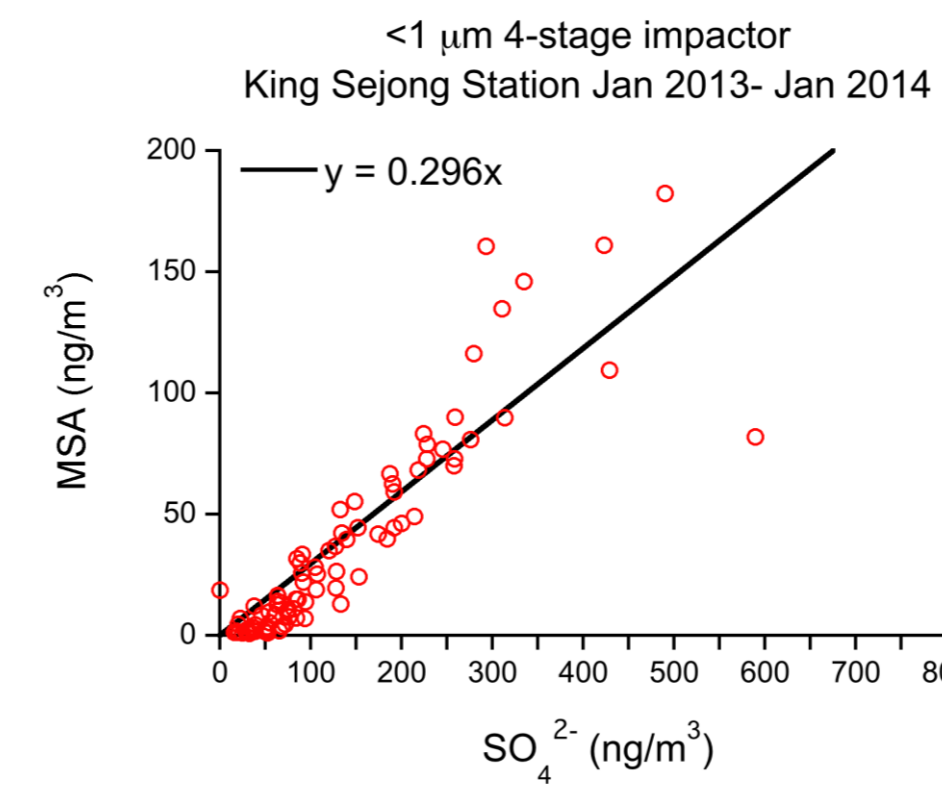
MSA and NH₄⁺ size distribution exhibits a peak in the submicron range, as expected for this secondary source.



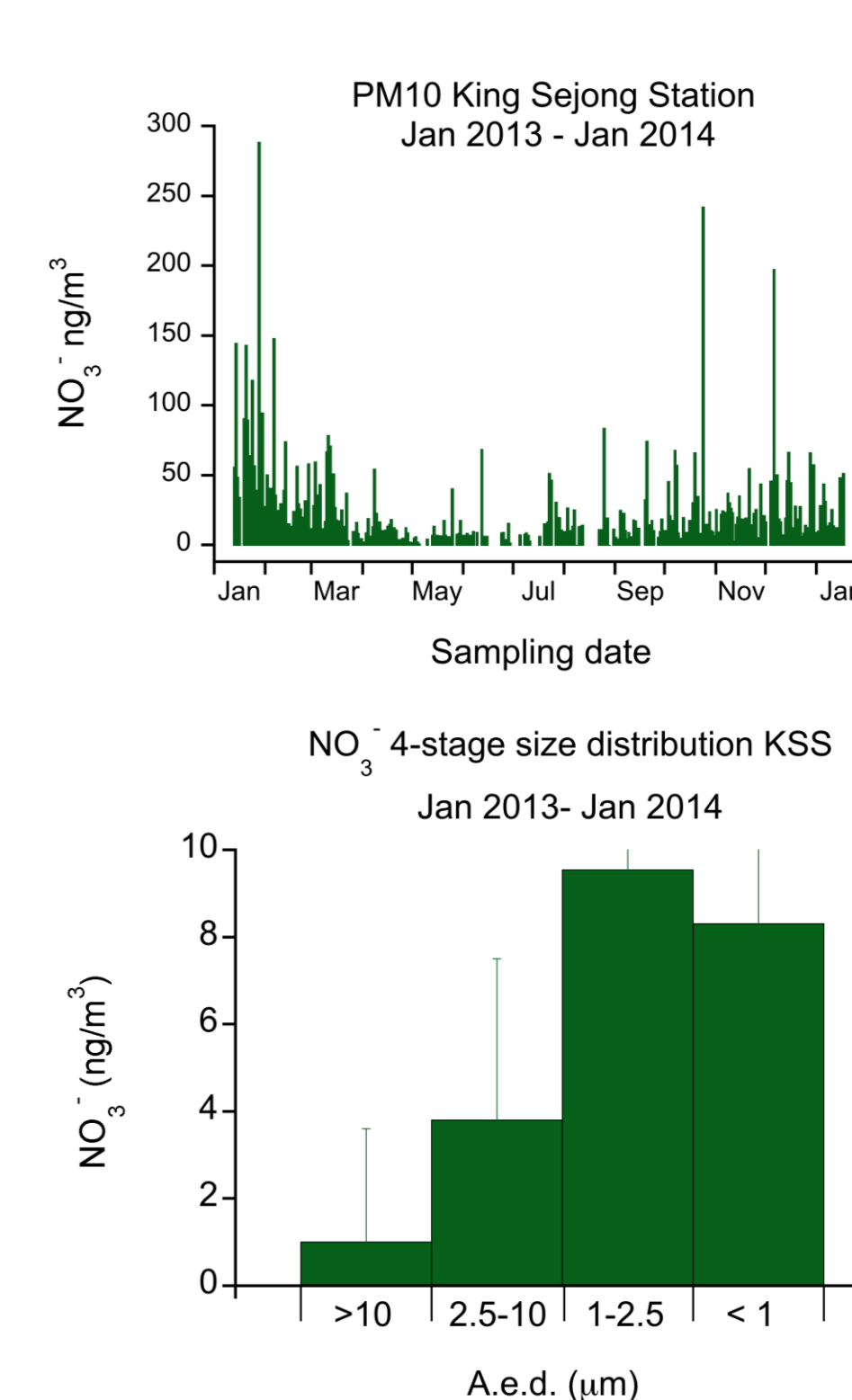
Neutralization processes of NH₄⁺ and H₂SO₄ in the submicron fraction



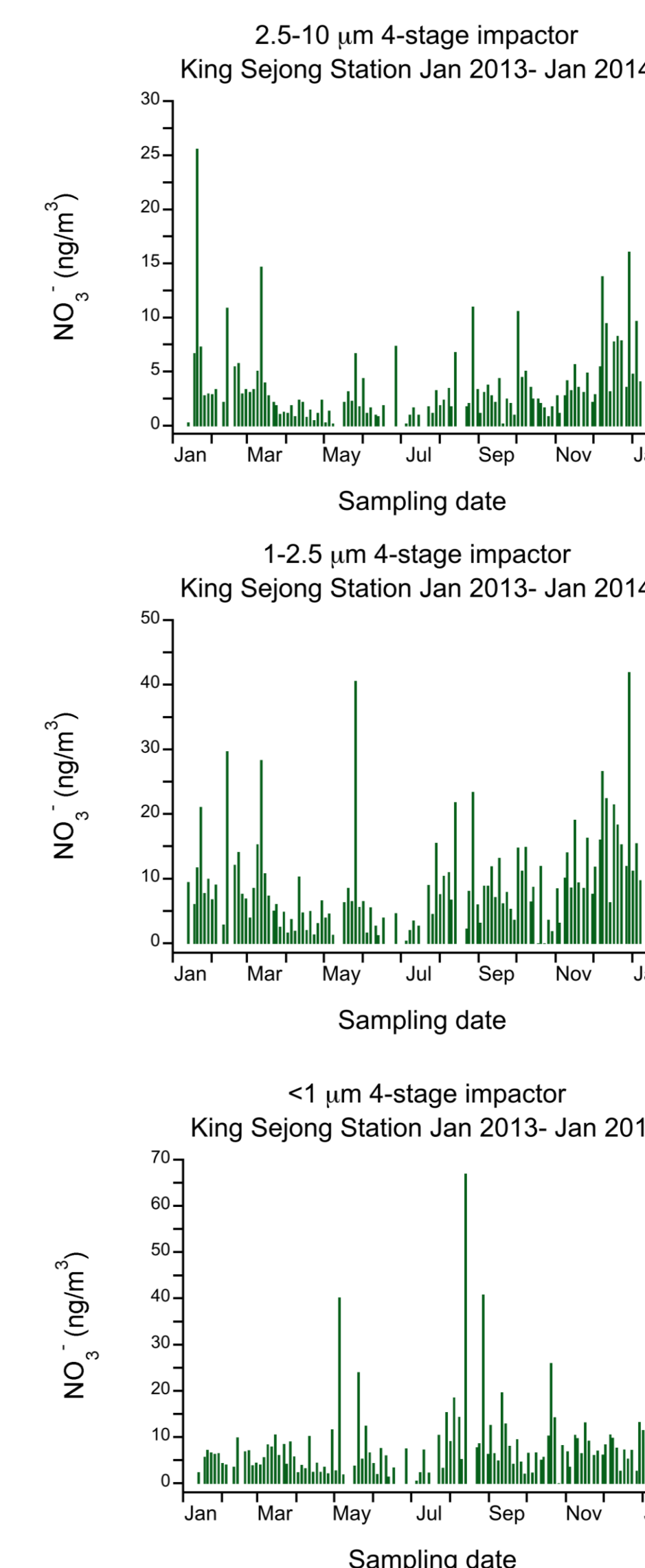
Sulphate/MSA ratio close to 3, in the range of Antarctic values



Nitrate



Nitrate shows summer maxima and the highest concentrations in the fine fractions: probably a mix of marine source, neutralization processes and long-range transport inputs from low latitudes.



The submicron fraction shows higher peaks during winter, probably due to the loss of nitric acid during summer (lower efficiency of fixation processes on the filter)