Synthesized measurements of reactive nitrogen fluxes onto a forest using gradient and relaxed eddy accumulation method

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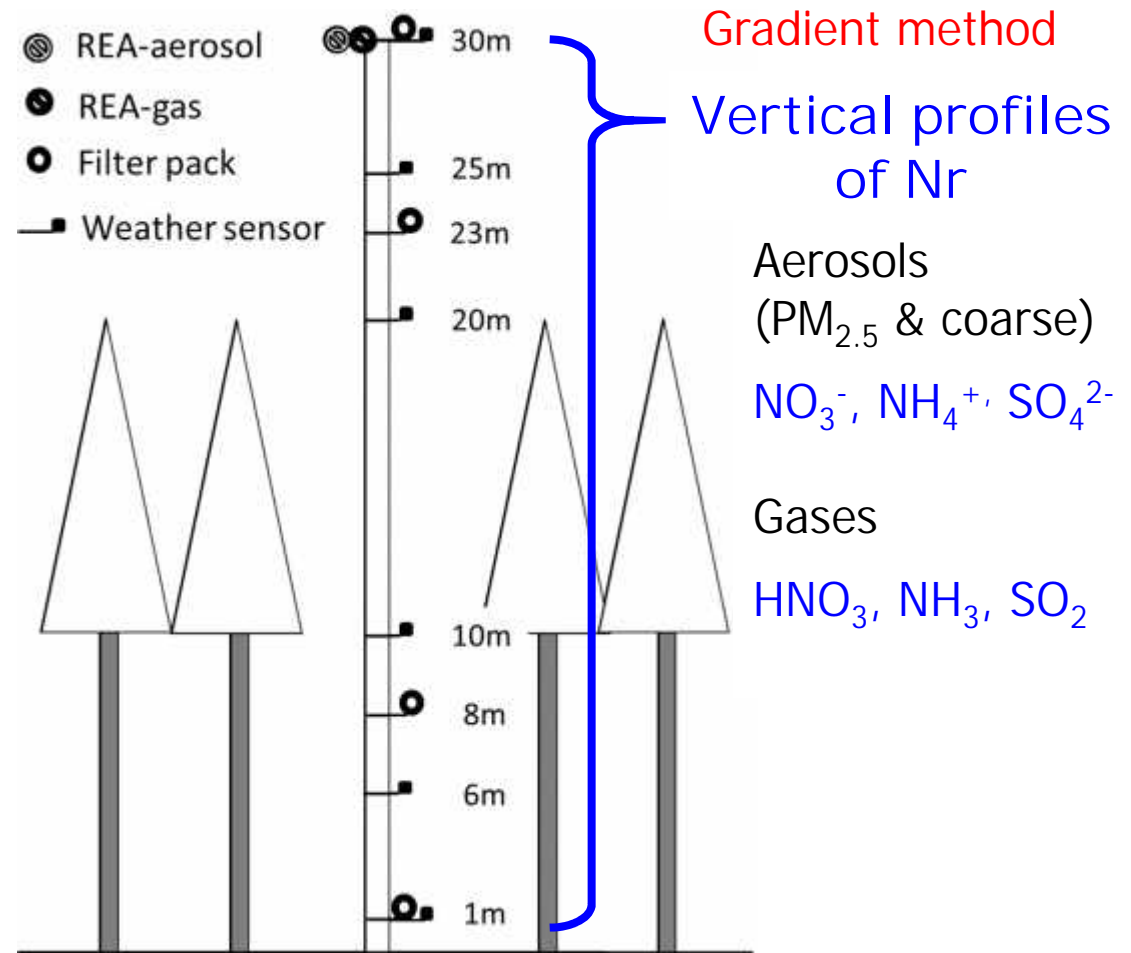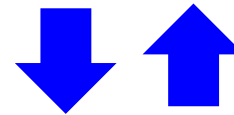
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REA-aerosol

REA-gas

Relaxed eddy accumulation (REA) method

Exchange fluxes of Nr

Gradient method

Vertical profiles of Nr

◎ REA-aerosol
◉ REA-gas
○ Filter pack
⌐■ Weather sensor

30m
25m
23m
20m
10m
8m
6m
1m

Aerosols (PM$_{2.5}$ & coarse)

NO_3^-, NH_4^+, SO_4^{2-}

Gases

HNO_3, NH_3, SO_2

Removal speed (Deposition velocity)

Theoretical Expectations

$HNO_3 > SO_2 > NO_3^-$ in coarse > $\textbf{NO}_3^-$ **in** $\textbf{PM}_{2.5}$ **=** SO_4^{2-} in $PM_{2.5}$

Results measured by the synthesized measurement system

$HNO_3 >$ $\textbf{NO}_3^-$ **in** $\textbf{PM}_{2.5}$ $> SO_2 > NO_3^-$ in coarse > SO_4^{2-} in $PM_{2.5}$