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Non-stomatal exchange in ammonia dry deposition models: comparison of two state-of-the-art approaches

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Table S1: List of frequently used symbols. Note that in some cases appropriate unit conversions are used in the text.

Symbol	Unit	Description
a	–	exponential decay parameter in the MNS non-stomatal resistance parameterization
AR	–	molar ratio of total acid to ammonia concentrations ((2[SO_2]+[HNO_3]+[HCl])/[NH_3])
d	m	zero-plane displacement height
$D_{\mathrm{NH_3}}$	$m^2\ s^{-1}$	molecular diffusivity of ammonia in air
F_{t}	$\mu g\ m^{-2}\ s^{-1}$	total (stomatal + non-stomatal) net flux density
G_{w}	$m\ s^{-1}$	non-stomatal conductance ($= R_{\mathrm{w}}^{-1}$)
H	$W\ m^{-2}$	sensible heat flux
h_{c}	m	canopy height
k	–	von Kármán constant (= 0.41)
L	m	Obukhov length
LAI	$m^2\ m^{-2}$	one-sided leaf area index
LE	$W\ m^{-2}$	latent heat flux
$R_{\mathrm{a}}\{z-d\}$	$s\ m^{-1}$	aerodynamic resistance at the reference height
R_{b}	$s\ m^{-1}$	quasi-laminar boundary layer resistance
R_{c}	$s\ m^{-1}$	canopy resistance
R_s	$s\ m^{-1}$	stomatal resistance
R_{w}	$s\ m^{-1}$	non-stomatal resistance
$R_{\mathrm{w,eff.}}$	$s\ m^{-1}$	effective non-stomatal resistance
$R_{\mathrm{w,min}}$	$s\ m^{-1}$	minimum non-stomatal resistance in the MNS parameterization
$R_{\mathrm{w,MNS}}$	$s\ m^{-1}$	modeled non-stomatal resistance after Massad et al. (2010)
$R_{\mathrm{w,obs.}}$	$s\ m^{-1}$	observed non-stomatal resistance
$R_{\mathrm{w,WK}}$	$s\ m^{-1}$	modeled non-stomatal resistance after Wichink Kruit et al. (2010)
RH	%	relative humidity
SN	–	molar ratio of sulfur dioxide to ammonia concentrations ([SO_2]/[NH_3])
T	°C	(air) temperature
u_*	$m\ s^{-1}$	friction velocity
$u\{z-d\}$	$m\ s^{-1}$	wind velocity at the reference height
$v_{\mathrm{d,max}}\{z-d\}$	$m\ s^{-1}$	maximum deposition velocity allowed by turbulence
$v_{\mathrm{d}}\{z-d\}$	$m\ s^{-1}$	deposition velocity at the reference height
z	m	measurement height above ground
z_0	m	roughness length
z_0'	m	notional height of trace gas exchange
$z-d$	m	reference height
β	$°C^{-1}$	temperature response parameter in the MNS non-stomatal resistance parameterization
Γ_{g}	–	ground-layer emission potential
Γ_{s}	–	stomatal emission potential
Γ_{w}	–	non-stomatal emission potential
ν_{air}	$m^2\ s^{-1}$	kinematic viscosity of air
$\chi_{\mathrm{a,(}n\ \mathrm{d)MA}}$	$\mu g\ m^{-3}$	backward-looking moving average of ambient concentration (with n-day moving window)
$\chi_{\mathrm{a}}\{z-d\}$	$\mu g\ m^{-3}$	ambient concentration at the reference height
χ_{c}	$\mu g\ m^{-3}$	canopy compensation point
χ_{s}	$\mu g\ m^{-3}$	stomatal compensation point
χ_{w}	$\mu g\ m^{-3}$	non-stomatal compensation point
Ψ_{H}	–	integrated stability correction function for entrained scalars
Ψ_{M}	–	integrated stability correction function for momentum

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