

S1 Leaf biochemical and biophysical parameters used in SCOPE and the spatially-homogeneous quasi-turbid simulation with DART-EB.

Table S1: Input parameters used consistently in SCOPE and DART-EB for the comparison of the two models.

Input parameter	Unit	Value	Description
Leaf biochemical parameters			
<i>Vcmax</i>	$\mu\text{mol}/\text{m}^2/\text{s}$	60	Maximum carboxylation capacity of Rubisco (at optimum temperature)
BallBerrySlope	(<i>m</i>)	8	Ball-Berry coefficient 'm' for stomatal regulation.
<i>BallBerry0</i>	-	0.01	Ball-Berry intercept term 'b' (if present, an iterative solution is activated to calculate <i>Ci</i> (CO_2 concentration inside the leaf). Set to 0 to disable iteration.
<i>type</i>	-	C3	Photochemical pathway (0: C3, 1: C4).
<i>kV</i>	-	0.64	Extinction coefficient for <i>Vcmax</i> in the vertical (to calculate fV - Vertical profile of <i>Vcmax</i>)
<i>RdPerVcmax25</i> <i>Rdparam</i>	-	0.015	Respiration as fraction of <i>Vcmax25</i> to calculate dark respiration. If it is unknown, <i>cf</i> .
<i>stressfactor</i>	-	1	Stress factor to reduce <i>Vcmax</i> (1: no stress)
<i>Kn0</i> <i>Knalpha</i> <i>Knbeta</i>	-	2.48 2.83 0.114	Parameters for empirical Kn (NPQ) model: $\text{Kn} = \frac{\text{Kn0} \times (1 + \text{beta}) \times x^{\text{alpha}}}{\text{beta} + x^{\text{alpha}}}$
Canopy			
<i>LAI</i>	m^2/m^2	2	Leaf Area Index
<i>LIDFa</i>	-	-0.35	<i>LIDF</i> (leaf inclination) parameters for spherical leaf
<i>LIDFb</i>	-	-0.15	
<i>hc</i>	<i>m</i>	1	Vegetation height
Meteo			
<i>Ta</i>	$^{\circ}\text{C}$	20	Air temperature above the canopy
<i>p</i>	<i>hPa</i>	970	Air pressure
<i>Oa</i>	mmol/mol	209	Concentration of O2 in the boundary layer
Constants			
<i>rhoa</i>	kg/m^3	1.2047	Specific mass of air or air density
<i>Mair</i>	g/mol	28.96	Molecular mass of dry air
<i>R</i>	$\text{J}/\text{K}/\text{mol}$	8.314	Molar gas constant
<i>Ca</i>	<i>ppm</i>	380	atmospheric CO2 concentration
<i>ea</i>	<i>hPa</i>	15	atmospheric vapour pressure