Supplement to "COSMO-BEP-Tree v1.0: a coupled urban climate model with explicit representation of street trees"

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Table 1. Number and percentage of the 10 most common tree species found as public street tree in the inner part of Basel. The data are derived from the inventory of urban trees of the city of Basel (Basel-Stadt, 2019).

Species	Num.	%	g_s [mmol m^{-2} s^{-1}]	
			night	day
Tilia x euchlora (Caucasian lime)	3433	11.3	20[a]	100[a]
Platanus x hispanica (London plane)	2766	9.1	18[b]	180[b]
Aesculus hippocastanum (Horse-chestnut)	2083	6.9	20	90
Acer platanoides (Norway maple)	1495	4.9	18	180
Tilia cordata (Small-leaved lime)	990	3.3	20[a]	100[a]
Carpinus betulus (Common hornbeam)	903	3.0	20[c]	100[c]
Acer campestre (Field maple)	851	2.8	18[b]	180[b]
Pinus sylvestris (Scots pine)	682	2.3	17[d]	330[d]
Quercus robur (Common oak)	671	2.2	22	210
Taxus baccata (Common yew)	651	2.1	15[e]	80[e]
Average[f]			19	142

[a] values of *Tilia europaea*. [b] values of *Acer platanoides*. [c] from Keel et al. (2007) Fig. 2 year 2003. For night-time, the value from *Tilia europaea* are used. [d] from Campbell and Norman (2012) Table 7.2 values for *Pinus monticola*. [e] from Xiong et al. (2018) Fig. 2 . [f] weighted with the corresponding % of trees within the sample.

Table 2. Root-mean-square errors (RMSE), mean-bias errors (MBE) and coefficient of determination (r^2) of the observed air temperatures (T_{air}), specific humidity (q), and wind speed ($\mathbf{u}$) at the rural site of BLER (10 m above ground) during the period 22 June 2015 - 9 July 2015 (discarding the first 5 days as spin-up). In addition to the total RMSEs (T), the systematic (S) and the unsystematic (U) RMSEs are listed. The statistics are provided for the standard simulation (STD) only.

	RMSE (T/S/U)	MBE	r^2
T_{air} (K)	1.74 / 1.34 / 1.10	1.34	0.96
q $(g\,kg^{-1})$	1.33 / 0.60 / 1.19	-0.56	0.65
u $(m\,s^{-1})$	1.32 / 0.43 / 1.25	0.41	0.32

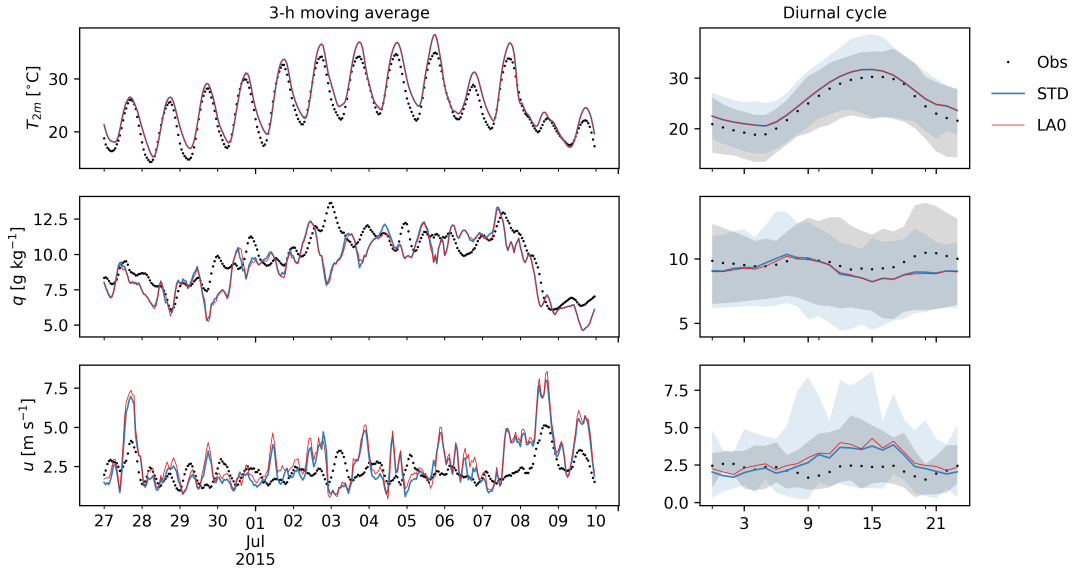

Figure 1. Comparison between observations (Obs) and model simulations of air temperature (a), specific humidity (b), wind speed (c), sensible heat flux (d) and latent heat flux (e) at the rural reference site BLER (10 m above ground) during the selected period (discarding the first 5 days as spin-up). Blue lines and red lines indicate the results from the STD and LAD0 model set-ups, respectively. The shaded areas represent the range of variability within the period for the observations and STD simulation only.

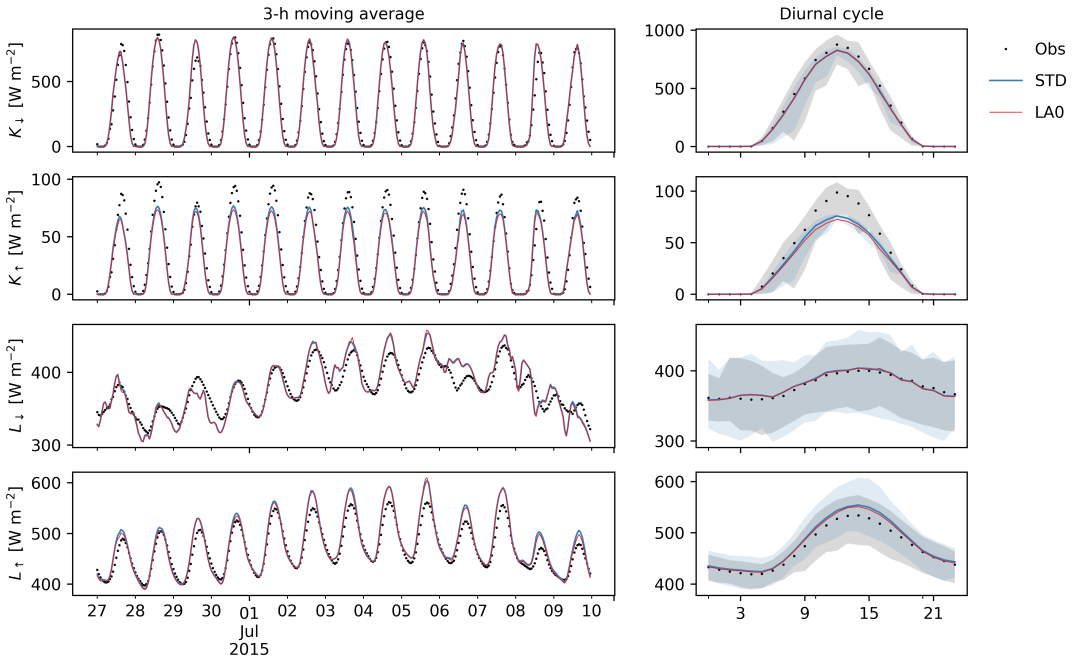

Figure 2. Comparison between observations (Obs) and model simulations of downward short-wave radiation $K_\downarrow$ (a), upward short-wave radiation $K_\uparrow$ (b), downward long-wave radiation $L_\downarrow$ (c) and upward long-wave radiation $L_\uparrow$ (d) at the site of BKLI during the selected period (discarding the first 5 days as spin-up). Blue lines and red lines indicate the results from the STD and LAD0 model set-ups, respectively. The shaded areas represent the range of variability within the period for the observations and STD simulation only.

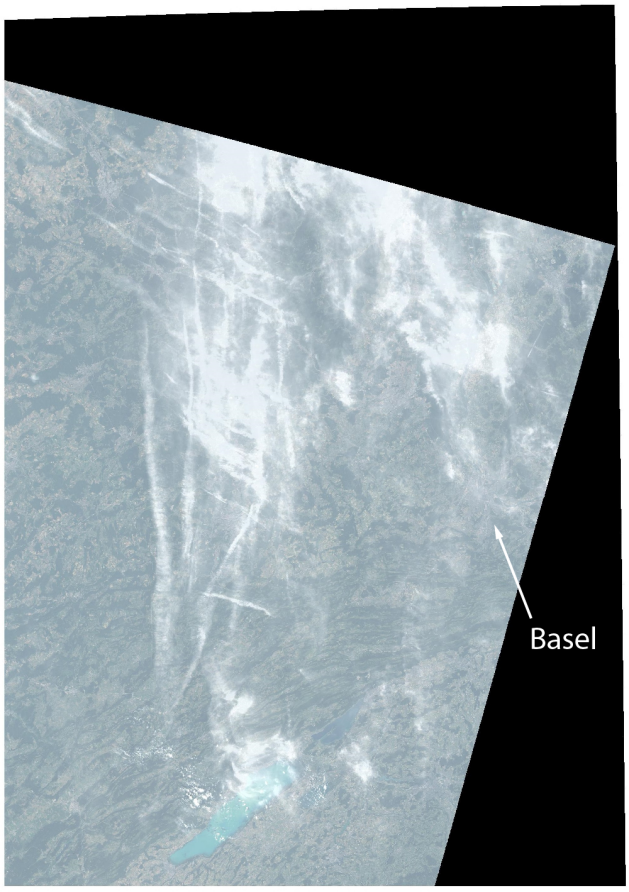

Figure 3. Cirrus clouds above the model domain detected from the cirrus band (Band 9) of Landsat 8 satellite during the overpass of 4 July 2015.

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