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Supplement of

Impact of stratiform liquid water clouds on vegetation albedo quantified by coupling an atmosphere and a vegetation radiative transfer model

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S1 Example libRadtran input-file

Below, we provide an exemplary libRadtran input file that was used to simulate the spectral upward and downward solar irradiances. The code is annotated and comments are marked with "#– –#".

```
#--SOALR--##
#--Radiative transfer equation solver--#
rte_solver disort
#--Number of streams--#
number_of_streams 12
#--Location of the extraterrestrial spectrum--#
source solar ../libRadtran/data/solar_flux/Coddington2023.dat
#--Solar zenith angle--#
sza 25.0
#--Simulated wavelength range [nm]--#
wavelength 249.5 3000.5
#--location of selected atmosphere file--#
atmosphere_file ../data/atmmod/afglms.dat
#--molecular absorption and resolution--#
mol_abs_param reptran medium
#--Surface albedo for first guess--#
albedo_library IGBP #--use albedo library
brdf_rpv_type 5 #-surface of albedo of mixed forest
#--Specification of liquid cloud (file )--#
ic_file 1D ../lw_cloud.dat
ic_properties yang2013 interpolate
ic_habit_yang2013 column_8elements moderate
#--Specification of liquid cloud (file )--#
wc_file 1D ../lib_input/wc_cloud.dat
#--scaling liquid water cloud optical thickness--##
wc_modify tau550 set 6.0
#--specify the output height of the simulations--##
zout 0.040 # 40 m above ground given in km
#--user defined output wavelength sza altitude direct_down diffuse_down diffuse_up irradiance
    ↪ --##
output_user lambda sza zout edir edn eup
```

S2 Example SCOPE2.0 input-file

Below, we provide an exemplary SCOPE2.0 parameter file that was used within the simulations. Comments are adapted from the default file that was provided by the SCOPE2.0 package.

```
PROSPECT,
Cab,40
Cca,10
Cdm,0.012
Cw,0.009
Cs,0
Cant,1
Cp,0
Cbc,0
N,2.1
rho_thermal,0.01
tau_thermal,0.01
,
Leaf_Biochemical,
Vcmax25,60
BallBerrySlope,8
BallBerry0,0.01
Type,0
kV,0.64
Rdparam,0.015
Kn0,2.48
Knalpha,2.83
Knbeta,0.114
 ,
Leaf_Biochemical_magnani,
Tyear,15
beta,0.51
kNPQs,0
qLs,1
stressfactor,1
,
Fluorescence,
fqe,0.01
,
Soil,
spectrum,1
rss,500
rs_thermal,0.06
cs,1180
rhos,1800
lambdas,1.55
SMC,25
BSMBrightness,0.5
-----continuation of first column-----
BSMlat,25
BSMlon,45
,
Canopy,
LAI,3.0
hc,20
LIDFa,-0.35
LIDFb,-0.15
leafwidth,0.1
Cv,1
crowndiameter,1
,
Meteo,
z,20
Rin,600
Ta,20
Rli,300
p,970
ea,15
u,2
Ca,410
Oa,209
,
Aerodynamic,
zo,0.25
d,1.34
Cd,0.3
rb,10
CR,0.35
CD1,20.6
Psicor,0.2
CSSOIL,0.01
rbs,10
rwc,0
,
timeseries,
startDOY,20220621
endDOY,20220621
LAT, 50.00
LON, 13.00
timezn,1
,
Angles,
tts,35.0
tto, 0.0
psi, 0.0
```