Overview of all namoptions in DALES

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Chapter 1

Introduction

This document gives an overview of all namelist options in version 3.2 of the Dutch Atmospheric Large Eddy Simulation (DALES) model. Only general information concerning these options is presented. For more detailed information about the model, the reader is referred to Heus et al. (2009).
Much information in this document originates from Heus et al. (2009). All information from that document is checked and corrected where necessary. The options are also updated to match the current version.

Chapter 2

Namoptions overview

All options that can be set for the LES experiments will be discussed in the following paragraphs. These options are listed in a separate paragraph for all name lists. For all name lists, the options are given with their default values, possible values, a description and the unit. The possible values are denoted by an x. The paragraphs are grouped in two sections. In the first section, the main modules are discussed. In the second section an overview of the extra modules is presented.

2.1 Main modules

2.1.1 Namelist DOMAIN

Option	Default	Possible values	Description	Unit
imax	64	$x \in \mathbb{N}^*$	Number of horizontal grid points in x-direction	-
jtot	64	$x = n \cdot N_{\text{processors}}, \quad n \in \mathbb{N}^*$	Number of horizontal grid points in y-direction	-
kmax	96	$x \in \mathbb{N}^*$	Number of vertical grid points	-
xsize	-1	$x \in \mathbb{N}^*$	Horizontal size of the simulated domain	m
ysize	-1	$x \in \mathbb{N}^*$	Horizontal size of the simulated domain	m
xlat	52	$x \in \mathbb{R}, \quad -90 \leq x \leq 90$	Latitude	$^\circ$
xlon	0	$x \in \mathbb{R}, \quad 0 \leq x \leq 360$	Longitude	$^\circ$
xday	1	$x \in \mathbb{R}, \quad 1 \leq x \leq 365$	Number of the day	-
xtime	0	$x \in \mathbb{R}, \quad 0 \leq x < 24$	UTC time of the day	h
ksp	min($\frac{3}{4}$kmax, kmax - 15)	$x \in \mathbb{N}, \quad 0 \leq x \leq (\text{kmax} - 15)$	Lower height of sponge layer	-

2.1.2 Namelist DYNAMICS

Option	Default	Possible values	Description	Unit
cu	0	$x \in \mathbb{R}$	Transformation velocity of the Galilei transformation in x-direction	m s^{-1}
cv	0	$x \in \mathbb{R}$	Transformation velocity of the Galilei transformation in y-direction	m s^{-1}
llsadv	.false.	$x \in$ {.false., .true.}	Switch for large scale forcings	-
lqlnr	.true.	$x \in$ {.false., .true.}	Switch for Newton-Raphson approximation of the liquid water content	-
iadv_mom iadv_tke iadv_thl iadv_qt iadv_sv(1:nsv)	5 -1 -1 -1 -1	$x \in \{1, 2, 5, 52, 6, 62, 7\}$	Advection scheme for momentum, TKE, θ_l, q_t and scalars: 1 = 1st order upwind 2 = 2nd order central difference 5 = Option 6 + 5th order upwind 52 = Horizontal 5th & vertical 2nd 6 = 6th order central difference 62 = Horizontal 6th & vertical 2nd 7 = Kappa scheme	-

2.1.3 Namelist PHYSICS

Option	Default	Possible values	Description	Unit
thls	-1	$x \in \mathbb{R}, \quad x > 0$	Liquid water potential temperature at the surface	K
ps	-1	$x \in \mathbb{R}, \quad x > 0$	Pressure at the surface	Pa
isurf	-1	$x \in \{1, 2, 3, 4, 10\}$	Flag for surface parametrization 1 = Interactive scheme (using radiation) 2 = Forced surface temperature; fluxes are calculated 3 = Forced momentum, moisture and heat flux; surface temperature is calculated 4 = Forced moisture and heat flux; u_* and surface temperature are calculated 10 = User defined surface scheme. Can only be used for certain cases (using the file moduser.f90)	-
z0	-1	$x \in \mathbb{R}, \quad x > 0$	Surface roughness	m
ustin	-1	$x \in \mathbb{R}, \quad x > 0$	Prescribed friction velocity	m s^{-1}
wtsurf	-1	$x \in \mathbb{R}, \quad x > 0$	Flux of liq. water pot. temp. at the surface	K m s^{-1}
wqsurf	-1	$x \in \mathbb{R}$	Flux of total water content	kg kg^{-1} m s^{-1}
wsvsurf(1:nsv)	0	$x \in \mathbb{R}$	Flux of scalar n at the surface	ppb m s^{-1}
ltimedep	.false.	$x \in \{$.false., .true.$\}$	Switch for timedependent fluxes and large scale forcings	-
lcoriol	.true.	$x \in \{$.false., .true.$\}$	Switch for coriolis force	-
igrw_damp	2	$x \in \{0, 1, 2, 3\}$	Flag for gravity wave damping 0 = no damping 1 = fast damping of wind to average wind & slow damping of average to geowind 2 = fast damping of wind to geowind 3 = fast damping of wind to average wind	-

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Option	Default	Possible values	Description	Unit
geodamptime	7200	$x \in \mathbb{R}, \quad x > 0$	Time scale for nudging to geowind in sponge layer	s
lmomsubs	.false.	$x \in \{$.false., .true.$\}$	Switch to apply subsidence on momentum	-
lmoist	.true.	$x \in \{$.false., .true.$\}$	Switch for calculation of moisture fields	-
lneutraldrag			Obsolete	
chi_half			Obsolete	
timerad	0	$x \in \mathbb{R}, \quad x > 0$	Value for sampling interval of radiation scheme	s
iradiation	0	$x \in \{0, 1, 2, 3, 10\}$	Flag for radiation calculations 0 = No radiation 1 = Full radiation (not implemented yet) 2 = Parametrized radiation 3 = Simple surface radiation for land surface model 10 = User defined radiation (use `rad_user.f90`)	-
useMcICA	.true.	$x \in \{$.false., .true.$\}$	Switch for the Monte Carlo Independent Column Approach	-
rad_ls	.true.	$x \in \{$.false., .true.$\}$	Switch for prescribed radiative forcing	-
rad_longw	.true.	$x \in \{$.false., .true.$\}$	Switch for parametrized longwave radiative forcing	-
rad_shortw	.true.	$x \in \{$.false., .true.$\}$	Switch for parametrized shortwave radiative forcing	-
rad_smoke	.false.	$x \in \{$.false., .true.$\}$	Switch for longwave divergence for smoke cloud	-
irad	-1	$x \in \{-1, 0, 1, 2, 3, 4, 10\}$	Deprecated flag to force (iradiation, rad_ls, rad_longw, rad_shortw, rad_smoke) -1 = - 0 = (0,-,-,-,-) 1 = (2,.true.,.false.,.false.,.false.) 2 = (2,.false.,.true.,.false.,.false.) 3 = (1,-,-,-,-)	-

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Option	Default	Possible values	Description	Unit
			4 = (2,.false.,.true.,.true.,.false.) 10 = (2,.false.,.false.,.false.,.true.)	
rka	130	$x \in \mathbb{R}, \quad x > 0$	Extinction coefficient (used if $iradiation = 2$)	$m^2\ kg^{-1}$
dlwbot	0	$x \in \mathbb{R}, \quad x \geq 0$	Longwave radiative flux jump at cloud bottom	$W\ m^{-2}$
dlwtop	74	$x \in \mathbb{R}, \quad x \geq 0$	Longwave radiative flux jump at cloud top	$W\ m^{-2}$
sw0	1100	$x \in \mathbb{R}, \quad x \geq 0$	Direct solar radiative component cloud top (assumes zero diffusive contribution)	$W\ m^{-2}$
gc	0.85	$x \in \mathbb{R}, \quad 0 \leq x \leq 1$	Asymmetry factor of droplet scattering angle distribution	-
sfc_albedo			Obsolete	
reff	1e-5	$x \in \mathbb{R}, \quad x > 0$	Cloud drop effective radius	m
isvsmoke	1	$x \in \mathbb{N}, \quad 0 \leq x \leq$ nsv	Number of passive scalar fields to be used for optical depth calculation (not used when $rad\_smoke = .false.$)	-
lmoduser	.false.	$x \in$ {.false., .true.}	Switch for user-defined forcing. Can only be used for certain cases (using the file moduser.f90)	-

2.1.4 Namelist RUN

Option	Default	Possible values	Description	Unit
iexpnr	000	$x \in \mathbb{R}, \quad x \geq 0$	Experiment number; every output filename ends with [.iexpnr]	-
dtmax	20	$x \in \mathbb{R}, \quad x > 0$	Maximum timestep that is used by the model	s
runtime	300	$x \in \mathbb{R}, \quad x > 0$	Total simulation (or: run) time	s
lwarmstart	.false.	$x \in$ {.false., .true.}	Flag for a "cold" or a "warm" start	-
startfile	-	$x =$ initd##h##mxxx.###	Basis for the name of the restartfiles	-
trestart	3600	$x \in \mathbb{R}, \quad x > 0$	Each $trestart$ seconds, a restart file is written to disk	s

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Option	Default	Possible values	Description	Unit
dtav_glob	60	$x = n \cdot$ dtmax, $n \in \mathbb{N}^*$	Global value for sampling interval of statistical routines	s
timeav_glob	3600	$x = n \cdot$ dtav_glob, $n \in \mathbb{N}^*$	Global value for writing interval of statistical routines	s
irandom	0	$x \in \mathbb{Z}$	Number to feed randomnizer with	-
krand	kmax	$x \in \mathbb{N}$, $1 \leq x \leq$ kmax	Top vertical full level of randomnization	-
randqt	1e-5	$x \in \mathbb{R}$, $x > 0$	Amplitude of randomnization of qt	kg kg^{-1}
randthl	0.1	$x \in \mathbb{R}$, $x > 0$	Amplitude of randomnization of thl	K
nsv	0	$x \in \mathbb{N}$, $0 \leq x \leq 100$	Number of additional passive scalars	-
ladaptive	.false.	$x \in \{$.false., .true.$\}$	If .true., this allows the model to vary time step, depending on numerical stability criteria	-
courant	1.4	$x \in \mathbb{R}$, $x > 0$	Courant number	-
peclet	0.15	$x \in \mathbb{R}$, $x > 0$	Peclet number	-
author	""	$x =$ "...."	Name of the author	-

2.1.5 Namelist SUBGRID

Option	Default	Possible values	Description	Unit
ldelta	.false.	$x \in \{$.false., .true.$\}$	Switch for diminished sfs in stable flow	-
lmason	.false.	$x \in \{$.false., .true.$\}$	Switch for decreased length scale near the surface	-
cf	2.5	$x \in \mathbb{R}$, $x > 0$	Filter constant	-
cn	0.76	$x \in \mathbb{R}$, $x > 0$	Subfilter scale parameter	-
Rigc	0.25	$x \in \mathbb{R}$, $x > 0$	Critical Richardson number	-
Prandtl	3	$x \in \mathbb{R}$, $x > 0$	Prandtl number	-
lsmagorinsky	.false.	$x \in \{$.false., .true.$\}$	Switch for smagorinsky subgrid scheme	-
cs	-1	$x \in \mathbb{R}$, $x > 0$	Smagorinsky constant	-
nmason	2	$x \in \mathbb{R}$, $x > 0$	Exponent in Mason correction function	-

2.2 Extra modules

2.2.1 Namelist NAMBUDGET

Option	Default	Possible values	Description	Unit
lbudget	.false.	$x \in \{$.false., .true.$\}$	Switch for turbulent TKE budget calculation	-
dtav	dtav_glob	$x = n \cdot$ dtmax, $\quad n \in \mathbb{N}^*$	Time interval for sampling of statistics	s
timeav	timeav_glob	$x = n \cdot$ dtav, $\quad n \in \mathbb{N}^*$	Time interval for writing statistics	s

2.2.2 Namelist NAMBULKMICROSTAT

Option	Default	Possible values	Description	Unit
lmicrostat	.false.	$x \in \{$.false., .true.$\}$	Switch for microphysics statistics calculation	-
dtav	dtav_glob	$x = n \cdot$ dtmax, $\quad n \in \mathbb{N}^*$	Time interval for sampling of statistics	s
timeav	timeav_glob	$x = n \cdot$ dtav, $\quad n \in \mathbb{N}^*$	Time interval for writing statistics	s

2.2.3 Namelist NAMCHECKSIM

Option	Default	Possible values	Description	Unit
tcheck	0	$x \in \mathbb{R}, \quad x > 0$	Time interval between checks of velocity divergence and Courant numbers	s

2.2.4 Namelist NAMCHEM

Option	Default	Possible values	Description	Unit
lchem	.false.	$x \in \{$.false., .true.$\}$	Switch to turn chemistry on and off	-
tnor	-	$x \in \mathbb{N}, \quad x \geq N_{\text{reactions}}$	Number of chemical reactions	-
firstchem	1	$x \in \mathbb{N}, \quad 1 \leq x \leq$ lastchem	Column number in scalar.inp of first chemical	-

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Option	Default	Possible values	Description	Unit
lastchem	nsv	$x \in \mathbb{N}$, firstchem $\leq x \leq$ nsv	Column number in scalar.inp of last chemical	-
ldiuvar	.false.	$x \in$ {.false., .true.}	Switches diurnal photolysis reaction rates	-
h_ref	12	$x \in \mathbb{R}, \quad 0 \leq x < 24$	Hour used to calculate photolysis rates if ldiuvar = .false.	h
lcloudKconst	.false.	$x \in$ {.false., .true.}	Switch to make photolysis reaction rates independent of cloud presence if .true.	-
lchconst	.false.	$x \in$ {.false., .true.}	Reaction rates are based on t_ref p_ref and q_ref instead of calculated T, p and q if .true.	-
t_ref	298	$x \in \mathbb{R}, \quad x \geq 0$	Reference temperature	K
q_ref	5.e-3	$x \in \mathbb{R}, \quad x \geq 0$	Reference humidity	kg kg^{-1}
p_ref	100000	$x \in \mathbb{R}, \quad x > 0$	Reference pressure	Pa
lchmovie	.false.	$x \in$ {.false., .true.}	Switch for extra output to make movies	-
dtchmovie	60	$x \in \mathbb{R}, \quad x > 0$	Time interval to write extra output	s
lsegr	.false.	$x \in$ {.false., .true.}	Switch for information about segregation in a Mixed Layer approach	-

2.2.5 Namelist NAMCLOUDFIELD

Option	Default	Possible values	Description	Unit
lcloudfield	.false.	$x \in$ {.false., .true.}	Switch for cloud field calculations	-
laddinfo	.false.	$x \in$ {.false., .true.}	Switch to enable writing of q_l and w values	-
dtav	dtav_glob	$x = n \cdot$ dtmax, $\quad n \in \mathbb{N}^*$	Time interval for sampling of statistics	s

2.2.6 Namelist NAMCROSSSECTION

Option	Default	Possible values	Description	Unit
lcross	.false.	$x \in$ {.false., .true.}	Switch for dumping of crosssections of the field	-

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Option	Default	Possible values	Description	Unit
dtav	dtav_glob	$x = n \cdot$ dtmax, $n \in \mathbb{N}^*$	Time interval for sampling of statistics	s
crossheight(1:100)	1: $x = 2$	$x \in \mathbb{N}$, $1 \leq x \leq$ kmax	Heights of the horizontal crosssection	-
crossplane	2	$x \in \mathbb{N}$, $1 \leq x \leq$ jtot$/N_{\text{processors}}$	Location of the vertical (xz) plane on every processor	-
crossortho	2	$x \in \mathbb{N}$, $1 \leq x \leq$ imax	Location of the vertical (yz) plane	-

2.2.7 Namelist NAMFIELDDUMP

Option	Default	Possible values	Description	Unit
lfielddump	.false.	$x \in$ {.false., .true.}	Switch for dumping of 3d-fields	-
dtav	dtav_glob	$x = n \cdot$ dtmax, $n \in \mathbb{N}^*$	Time interval for sampling of statistics	s
ldiracc	.false.	$x \in$ {.false., .true.}	Switch to dump into direct access files instead of Fortran unformatted files	-
klow	1	$x \in \mathbb{N}$, $1 \leq x \leq$ khigh	Lowest level of the 3d-field output	-
khigh	$kmax$	$x \in \mathbb{N}$, klow $\leq x \leq$ kmax	Highest level of the 3d-field output	-

2.2.8 Namelist NAMGENSTAT

Option	Default	Possible values	Description	Unit
lstat	.false.	$x \in$ {.false., .true.}	Switch for calculating generic slabaveraged statistics	-
dtav	dtav_glob	$x = n \cdot$ dtmax, $n \in \mathbb{N}^*$	Time interval for sampling of statistics	s
timeav	timeav_glob	$x = n \cdot$ dtav, $n \in \mathbb{N}^*$	Time interval for writing statistics	s

2.2.9 Namelist NAMMICROPHYSICS

Option	Default	Possible values	Description	Unit
imicro	0	$x \in \{0, 1, 2, 3, 10\}$	Flag for the microphysical scheme: 0 = No microphysics (all-or-nothing scheme) 1 = Drizzle microphysics 2 = Bulk microphysics 3 = Bin microphysics (inactive) 10 = User defined microphysics. Can only be used for certain cases (using the file moduser.f90)	-
l_sb	.true.	$x \in$ {.false., .true.}	Switch for KK00 (Khairoutdinov and Kogan, 2000) or SB (Seifert and Beheng, 2001, 2006) scheme resp.	-
l_sedc	.true.	$x \in$ {.false., .true.}	Switch for cloud droplet sedimentation	-
l_rain	.true.	$x \in$ {.false., .true.}	Switch for rain formation and evolution	-
l_mur_cst	.false.	$x \in$ {.false., .true.}	Switch for a constant value of μ_r (in raindrop gamma distribution)	-
mur_cst	5	$x \in \mathbb{R}, \quad x > 0$	Value for μ_r, a shape parameter for the rain drop number density distribution (used only if l_mur_cst = .true.)	-
Nc_0	70e6	$x \in \mathbb{R}, \quad x \geq 0$	Initial number of cloud droplets	-
sig_g	1.34	$x \in \mathbb{R}, \quad x \geq 0$	Geometric standard deviation of the cloud droplet drop size distribution	-
sig_gr	1.5	$x \in \mathbb{R}, \quad x \geq 0$	Geometric standard deviation of the rain droplet drop size distribution	-

2.2.10 Namelist NAMNETCDFSTATS

Option	Default	Possible values	Description	Unit
lnetcdf	-	$x \in$ {.false., .true.}	Switch to write NetCDF output	-

2.2.11 Namelist NAMNUDGE

Option	Default	Possible values	Description	Unit
lnudge	-	$x \in \{$.false., .true.$\}$	Switch to activate/deactivate nudging	-
tnudgefac	1	$x \in \mathbb{R}, \quad x > 0$	Nudgefactor	-

2.2.12 Namelist NAMPARTICLES

Option	Default	Possible values	Description	Unit
lpartic	.false.	$x \in \{$.false., .true.$\}$	Switch to enable/disable this routine	-
lpartsgs	.true.	$x \in \{$.false., .true.$\}$	Switch for subgrid diffusion	-
intmeth	3	$x \in \{0, 3\}$	Flag for time integration scheme 0 = particles stand still 3 = Adams-Bashfort second order scheme	-
lstat	.false.	$x \in \{$.false., .true.$\}$	Switch for particle statistics	-
dtav	60	$x = n \cdot$ dtmax, $\quad n \in \mathbb{N}^*$	Time interval for sampling of statistics	s
timeav	3600	$x = n \cdot$ dtav, $\quad n \in \mathbb{N}^*$	Time interval for writing statistics	s
ldump	.false.	$x \in \{$.false., .true.$\}$	Switch for dump of particle field	-
timedump	3600	$x \in \mathbb{R}, \quad x > 0$	Time interval for particle field dump	s
npartdump	10	$x \in \mathbb{N}, \quad 0 \leq x \leq 10$	Number of variables written at $timedump$, in order: x, y, z, u, v, w, θ_l, θ_v, q_t, q_l	-

2.2.13 Namelist NAMprojection

Option	Default	Possible values	Description	Unit
lproject	.false.	$x \in \{$.false., .true.$\}$	Switch to activate dumping of projections of the field	-
dtav	dtav_glob	$x = n \cdot$ dtmax, $\quad n \in \mathbb{N}^*$	Time interval for sampling of statistics	s

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Option	Default	Possible values	Description	Unit
projectheight	2	$x \in \mathbb{N}^*, \quad x \leq \text{kmax}$	Height of the xy-projection	-
projectplane	2	$x \in \mathbb{N}^*, \quad x \leq \frac{\text{jtot}}{N_{\text{processors}}}$	Position of the xz-plane on every processor	-

2.2.14 Namelist NAMRADSTAT

Option	Default	Possible values	Description	Unit
lstat	.false.	$x \in \{\text{.false.}, \text{.true.}\}$	Switch for calculating slabaveraged radiation statistics	-
lradclearair	.false.	$x \in \{\text{.false.}, \text{.true.}\}$	Another switch for calculating slabaveraged radiation statistics	-
dtav	dtav_glob	$x = n \cdot \text{dtmax}, \quad n \in \mathbb{N}^*$	Time interval for sampling of statistics	s
timeav	timeav_glob	$x = n \cdot \text{dtav}, \quad n \in \mathbb{N}^*$	Time interval for writing statistics	s

2.2.15 Namelist NAMSAMPLING

Option	Default	Possible values	Description	Unit
dtav	dtav_glob	$x = n \cdot \text{dtmax}, \quad n \in \mathbb{N}^*$	Time interval for sampling of statistics	s
timeav	timeav_glob	$x = n \cdot \text{dtav}, \quad n \in \mathbb{N}^*$	Time interval for writing statistics	s
lsampall	.false.	$x \in \{\text{.false.}, \text{.true.}\}$	Switch for sampling all data	-
lsampcl	.false.	$x \in \{\text{.false.}, \text{.true.}\}$	Switch for conditional sampling cloud ($q_l > 0$)	-
lsampco	.false.	$x \in \{\text{.false.}, \text{.true.}\}$	Switch for conditional sampling cloud core ($q_l > 0, \theta_v' > 0$)	-
lsampup	.false.	$x \in \{\text{.false.}, \text{.true.}\}$	Switch for conditional sampling updrafts ($w > 0$)	-
lsampbuup	.false.	$x \in \{\text{.false.}, \text{.true.}\}$	Switch for conditional sampling of buoyant updrafts ($w > 0, \theta_v' > 0$)	-

2.2.16 Namelist NAMSTATTEND

Option	Default	Possible values	Description	Unit
lstattend			Obsolete	
ltend	.false.	$x \in \{$.false., .true.$\}$	Switch for calculation of tendencies of prognostic variables	-
dtav	dtav_glob	$x = n \cdot$ dtmax, $\quad n \in \mathbb{N}^*$	Time interval for sampling of statistics	s
timeav	timeav_glob	$x = n \cdot$ dtav, $\quad n \in \mathbb{N}^*$	Time interval for writing statistics	s

2.2.17 Namelist NAMSTRESS

Option	Default	Possible values	Description	Unit
lstress	.false.	$x \in \{$.false., .true.$\}$	Switch for turbulent stress budget	-
dtav	dtav_glob	$x = n \cdot$ dtmax, $\quad n \in \mathbb{N}^*$	Time interval for sampling of statistics	s
timeav	timeav_glob	$x = n \cdot$ dtav, $\quad n \in \mathbb{N}^*$	Time interval for writing statistics	s

2.2.18 Namelist NAMSURFACE

Option	Default	Possible values	Description	Unit
isurf	-1	$x \in \{1, 2, 3, 4, 10\}$	Overrides isurf flag of Namelist PHYSICS if used.	-
lmostlocal	.false.	$x \in \{$.false., .true.$\}$	Switch to locally determine Obukhov length	-
lsmoothflux	.false.	$x \in \{$.false., .true.$\}$	Switch to create uniform sensible and latent heat flux over domain	-
lneutral	.false.	$x \in \{$.false., .true.$\}$	Switch to disable stability corrections	-
z0	-1		Obsolete	
z0mav	-1	$x \in \mathbb{R}, \quad x > 0$	Roughness length of momentum	m
z0hav	-1	$x \in \mathbb{R}, \quad x > 0$	Roughness length of heat	m
thls	-1	$x \in \mathbb{R}, \quad x > 0$	Surface liquid water potential temperature	K
ps	-1	$x \in \mathbb{R}, \quad x > 0$	Surface pressure	Pa
ustin	-1	$x \in \mathbb{R}, \quad x \geq 0$	Prescribed friction velocity	m s^{-1}
wtsurf	-1	$x \in \mathbb{R}$	Prescribed kinematic temperature flux	K m s^{-1}

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Option	Default	Possible values	Description	Unit
wqsurf	-1	$x \in \mathbb{R}$	Prescribed kinematic moisture flux	kg kg^{-1} m s^{-1}
wsvsurf(1:nsv)	0	$x \in \mathbb{R}[100]$	Prescribed surface scalar flux	ppb m s^{-1}
tsoilav	-	$x \in \mathbb{R}[4], \quad x[i] > 0$	Initial soil temperature (for 4 layers, only used if isurf = 1)	K
tsoildeepav	-	$x \in \mathbb{R}, \quad x > 0$	Soil bottom temperature (if isurf = 1)	K
phiwav	-	$x \in \mathbb{R}[4], \quad 0 \leq x[i] \leq 0.472$	Soil moisture (if isurf = 1 and preferably below 0.323)	m^3 m^{-3}
rootfav	-	$x \in \mathbb{R}[4], \quad 0 \leq x[i] \leq 1, \quad \sum_i x[i] = 1$	Root fraction (if isurf = 1)	-
Cskinav	-1	$x \in \mathbb{R}, \quad x \geq 0$	Heat capacity skin layer (if isurf = 1)	J K^{-1} m^{-2}
lambdaskinav	-	$x \in \mathbb{R}, \quad x \geq 0$	Heat conductivity skin layer (if isurf = 1)	J s^{-1} K^{-1} m^{-2}
albedoav	-1	$x \in \mathbb{R}, \quad 0 \leq x \leq 1$	Albedo (if isurf = 1)	-
Qnetav	-1	$x \in \mathbb{R}$	Net radiation (if iradiation $\neq 1$ and isurf = 1)	J s^{-1} m^{-2}
cvegav	-1	$x \in \mathbb{R}, \quad x \geq 0$	Vegetation cover	-
rsminav	-1	$x \in \mathbb{R}, \quad x \geq 0$	Minimal vegetation resistance (if isurf = 1)	s m^{-1}
rssoilminav	-1	$x \in \mathbb{R}, \quad x \geq 0$	Minimum soil evaporation resistance	-
LAIav	-1	$x \in \mathbb{R}, \quad x \geq 0$	Leaf area index (if isurf = 1)	m^2 m^{-2}
gDav	-	$x \in \mathbb{R}, \quad x \geq 0$	Correction for evaporation of tall vegetation (if isurf = 1)	-
rsisurf2	0	$x \in \mathbb{R}, \quad x \geq 0$	Vegetation resistance (if isurf = 2)	s m^{-1}

2.2.19 Namelist NAMTILT

Option	Default	Possible values	Description	Unit
ltilted	.false.	$x \in \{$.false., .true.$\}$	Switch for a tilted boundary layer	-
alfa	0	$x \in \mathbb{R}, \quad -\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$	Tilt angle	rad
lstat	.true.	$x \in \{$.false., .true.$\}$	Switch for statistics	-
dtav	dtav_glob	$x = n \cdot$ dtmax, $\quad n \in \mathbb{N}^*$	Time interval for sampling of statistics	s
timeav	timeav_glob	$x = n \cdot$ dtav, $\quad n \in \mathbb{N}^*$	Time interval for writing statistics	s

2.2.20 Namelist NAMTIMESTAT

Option	Default	Possible values	Description	Unit
ltimestat	.false.	$x \in \{$.false., .true.$\}$	Switch for calculation of time series	-
dtav	dtav_glob	$x = n \cdot$ dtmax, $\quad n \in \mathbb{N}^*$	Time interval for sampling of statistics	s
iblh_var	iblh_thv	$x \in \{-1, -2, -3\}$	Flag for the variable used to calculate boundary layer height -1 = virtual pot. temp. θ_v -2 = liquid water pot. temp. θ_l -3 = total humidity q_t	-
iblh_meth	iblh_grad	$x \in \{1, 2, 3\}$	Flag for the method used to calculate boundary layer height 1 = use flux of selected variable 2 = use gradient of selected variable 3 = use a threshold (auto or user specified)	-
blh_thres	-1	$x \in \mathbb{R}, \quad x \geq 0$	Threshold for the selected variable, used only for iblh_thres method	K or kg kg^{-1}
blh_nsamp	4	$x \in \mathbb{N}^*, \quad x \leq$ kmax	Number of levels to integrate over	-

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