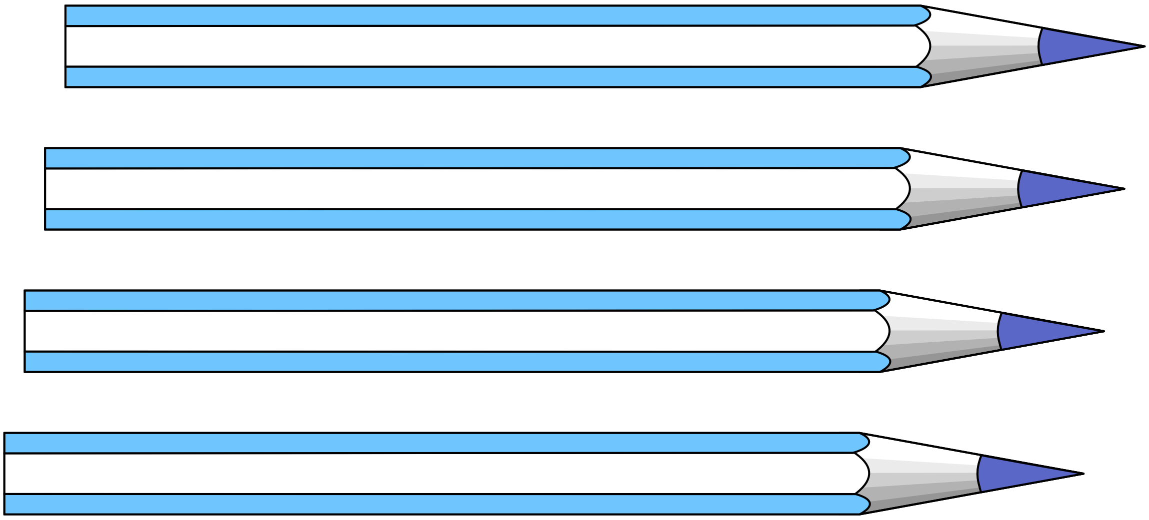
The Pencil Code:

A High-Order MPI code for MHD Turbulence

User's and Reference Manual



2018 年 10 月 23 日

http://www.nordita.org/software/pencil-code/

https://github.com/pencil-code/pencil-code

1 Startup and run-time parameters

1.1 List of startup parameters for ‘start.in’

The following table lists all (at the time of writing, September 2002) namelists used in ‘start.in’, with the corresponding parameters and their default values (in square brackets). Any variable referred to as a flag can be set to any nonzero value to switch the corresponding feature on. Not all parameters are used for a given scenario. This list is not necessarily up to date; also, in many cases it can only give an idea of the corresponding initial state; to get more insight and the latest set of parameters, you need to look at the code.

The value ε corresponds to 5 times the smallest number larger than zero. For single precision, this is typically about $\varepsilon \approx 5 \times 1.2{\times}10^{-7} = 6{\times}10^{-7}$; for double precision, $\varepsilon \approx 10^{-15}$.

Variable [default value]	Meaning
	Namelist init_pars
cvsid [”]	the svn identification string, which allows you to keep track of the version of ‘start.in’.
ip [14]	(anti-)verbosity level: ip=1 produces lots of diagnostic output, ip=14 virtually none.
xyz0 [$(-\pi, -\pi, -\pi)$], Lxyz [$(2\pi, 2\pi, 2\pi)$], lperi [(T,T,T)]	determine the geometry of the box. All three are vectors of the form (x-comp., y-comp., z-comp.); xyz0 describes the left (lower) corner of the box, Lxyz the box size. lperi specifies whether a direction is considered periodic (in which case the last point is omitted) or not. In all cases, three ghost zones will be added.
lprocz_slowest [T]	if set to F, the ordering of processor numbers is changed, so the z processors are now in the inner loop. Since nprocy=4 is optimal (see Sect. ??), you may want to put lprocz_slowest=T when nygrid>nzgrid.
lwrite_ic [F]	if set T, the initial data are written into the file ‘VAR0’. This is generally useful, but doing this all the time uses up plenty of disk space.

lnowrite [F]	if set T, all initialization files are written, including the param.nml file, except 'var.dat'. This option allows you to use old filevar.dat files, but updates all other initialization files. This could be useful after having changed the code and, in particular, when the 'var.dat' files will be overwritten by 'remesh.csh'.
lwrite_aux [F]	if set T, auxiliary variables (those calculated at each step, but not evolved mathematically) to 'var.dat' after the evolved quantities.
lwrite_2d [F]	if set T, only 2D-snapshots are written into VAR files in the case of 2D-runs with $nygrid = 1$ or $nzgrid = 1$.
lread_oldsnap [F]	if set T, the old snapshot will be read in before producing (overwriting) initial conditions. For example, if you just want to add a perturbation to the magnetic field, you'd give no initial condition for density and velocity (so you keep the data from a hopefully relaxed run), and just add whatever you need for the magnetic field. In this connection you may want to touch NOERASE, so as not to erase the previous data.
lread_oldsnap_nomag [F]	if set T, the old snapshot from a non-magnetic run will be read in before producing (overwriting) initial conditions. This allows one to let a hydrodynamic run relax before adding a magnetic field. However, for this to work one has to modify manually 'data/param.nml' by adding an entry for MAGNETIC_INIT_PARS or PSCALAR_-INIT_PARS. In addition, for idl to read correctly after the first restarted run, you must adjust the value of mvar in 'data/dim.dat'
lread_oldsnap_nopscalar [F]	if set T, the old snapshot from a run without passive scalar will be read in before producing (overwriting) initial conditions. This allows one to let a hydrodynamic run relax before adding a passive scalar.
lshift_origin [F,F,F]	if set T for any or some of the three directions, the mesh is shifted by 1/2 meshpoint in that or those directions so that the mesh goes through the origin.
unit_system ['cgs']	you can set this character string to 'SI', which means that you can give physical dimensions in SI units. The default is cgs units.

unit_length [1]	allows you to set the unit length. Suppose you want the unit length to be 1 kpc, then you would say unit_-length='3e21'. (Of course, politically correct would be to say unit_system='SI' in which case you say unit_-length='3e19'.)
unit_velocity [1]	Example: if you want km/s you say unit_length='1e5'.
unit_density [1]	Example: if you want your unit density to be $10^{-24}\,\mathrm{g/cm^3}$ you say unit_density='1e-24'.
unit_temperature [1]	Example: unit_temperature='1e6' if you want mega-Kelvin.
random_gen [system]	choose random number generator; currently valid choices are 'system' (your compiler's generator), 'min_std' (the 'minimal standard' generator ran0() from 'Numerical Recipes'), 'nr_f90' (the Parker-Miller-Marsaglia generator ran() from 'Numerical Recipes for F90').
bcx [('p', 'p', ...)], bcy [('p', 'p', ...)], bcz [('p', 'p', ...)]	boundary conditions. See Sect. ?? for a discussion of where and how to set these.
pretend_lnTT [F]	selects $\ln T$ as fundamental thermodynamic variable in the entropy module

Namelist hydro_init_pars

inituu ['zero']	initialization of velocity. Currently valid choices are 'zero' ($\boldsymbol{u} = 0$), 'gaussian-noise' (random, normally-distributed u_x,u_z), 'gaussian-noise-x' (random, normally-distributed u_x), 'sound-wave' (sound wave in x direction), 'shock-tube' (polytropic standing shock), 'bullets' (blob-like velocity perturbations), 'Alfven-circ-x' (circularly polarized Alfven wave in x direction), 'const-ux' (constant x-velocity), 'const-uy' (constant y-velocity), 'tang-discont-z' (tangential discontinuity: velocity is directed along x, jump is at $z = 0$), 'Fourier-trunc' (truncated Fourier series), 'up-down' (flow upward in one spot, downward in another; not solenoidal).
ampluu [0.]	amplitude for some types of initial velocities.
widthuu [0.1]	width for some types of initial velocities.
urand [0.]	additional random perturbation of $\boldsymbol{u}$. If urand>0, the perturbation is additive, $u_i \mapsto u_i + u_{\mathrm{rand}}\mathcal{U}_{[0.5,0.5]}$; if urand<0, it is multiplicative, $u_i \mapsto u_i \times u_{\mathrm{rand}}\mathcal{U}_{[0.5,0.5]}$; in both cases, $\mathcal{U}_{[0.5,0.5]}$ is a uniformly distributed random variable on the interval $[-0.5, 0.5]$.
uu_left [0.], uu_right [0.]	needed for inituu='shock-tube'.

Namelist density_init_pars

initlnrho ['zero']	initialization of density. Currently valid choices are 'zero' ($\ln\rho = 0$), 'isothermal' (isothermal stratification), 'polytropic_simple' (polytropic stratification), 'hydrostatic-z-2' (hydrostatic vertical stratification for isentropic atmosphere), 'xjump' (density jump in x of width widthlnrho), 'rho-jump-z' (density jump in z of width widthlnrho), 'piecew-poly' (piecewise polytropic vertical stratification for solar convection), 'polytropic' (polytropic vertical stratification), 'sound-wave' (sound wave), 'shock-tube' (polytropic standing shock), 'gaussian-noise' (Gaussian-distributed, uncorrelated noise), 'gaussian-noise' (Gaussian-distributed, uncorrelated noise in x, but uniform in y and z), 'hydrostatic-r' (hydrostatic radial density stratification for isentropic or isothermal sphere), 'sin-xy' (sine profile in x and y), 'sin-xy-rho' (sine profile in x and y, but in ρ, not $\ln\rho$), 'linear' (linear profile in $\boldsymbol{k}\cdot\boldsymbol{x}$), 'planet' (planet solution; see §??).
gamma [5./3]	adiabatic index $\gamma = c_p/c_v$.
cs0 [1.]	can be used to set the dimension of velocity; larger values can be used to decrease stratification
rho0 [1.]	reference values of sound speed and density, i. e. values at height zref.
ampllnrho [0.], widthlnrho [0.1]	amplitude and width for some types of initial densities.
rho_left [1.], rho_right [1.]	needed for initlnrho='shock-tube'.
cs2bot [1.], cs2top [1.]	sound speed at bottom and top. Needed for some types of stratification.
	Namelist grav_init_pars

zref [0.]	reference height where in the initial stratification $c_\mathrm{s}^2 = c_\mathrm{s0}^2$ and $\ln\rho = \ln\rho_0$.
gravz [−1.]	vertical gravity component g_z.
grav_profile ['const']	constant gravity $g_z =$ gravz (grav_profile='const') gravity or linear profile $g_z =$ gravz $\cdot\, z$ (grav_profile='linear', for accretion discs and similar).
z1 [0.], z2 [1.]	specific to the solar convection case initlnrho='piecew-poly'. The stable layer is $z_0 < z < z_1$, the unstable layer $z_1 < z < z_2$, and the top (isothermal) layer is $z_2 < z < z_\mathrm{top}$.
nu_epicycle [1.]	vertical epicyclic frequency; for accretion discs it should be equal to Omega, but not for galactic discs; see Eq. (??) in Sect. ??.
grav_amp [0.], grav_tilt [0.]	specific to the tilted gravity case (amplitude and angle wrt the vertical direction).

Namelist entropy_init_pars	
initss ['nothing']	initialization of entropy. Currently valid choices are 'nothing' (leaves the initialization done in the density module unchanged), 'zero' (put $s = 0$ explicitly; this may overwrite the initialization done in the density module), 'isothermal' (isothermal stratification, $T =$ const), 'isobaric' (isobaric, $p =$ const), 'isentropic' (isentropic with superimposed hot [or cool] bubble), 'linprof' (linear entropy profile in z), 'piecew-poly' (piecewise polytropic stratification for convection), 'polytropic' (polytropic stratification, polytropic exponent is mpoly0), 'blob' (puts a gaussian blob in entropy for buoyancy experiments; see Ref. [?] for details) 'xjump' (jump in x direction), 'hor-tube' (horizontal flux tube in entropy, oriented in the y-direction).

pertss ['zero']	additional perturbation to entropy. Currently valid choices are 'zero' (no perturbation) 'hexagonal' (hexagonal perturbation for convection).
ampl_ss [0.], widthss [2ε]	amplitude and width for some types of initial entropy.
grads0 [0.]	initial entropy gradient for initss=linprof.
radius_ss [0.1]	radius of bubble for initss=isentropic.
mpoly0 [1.5], mpoly1 [1.5], mpoly2 [1.5]	specific to the solar convection case initss=piecew-poly: polytropic indices of unstable (mpoly0), stable (mpoly1) and top layer (mpoly2). If the flag isothtop is set, the top layer is initialized to be isothermal, otherwise thermal (plus hydrostatic) equilibrium is assumed for all three layers, which results in a piecewise polytropic stratification.
isothtop [0]	flag for isothermal top layer for initss=piecew-poly.
khor_ss [1.]	horizontal wave number for pertss=hexagonal

Namelist magnetic_init_pars

initaa ['zero'] — initialization of magnetic field (vector potential). Currently valid choices are

'Alfven-x' (Alfvén wave traveling in the x-direction; this also sets the velocity),

'Alfven-z' (Alfvén wave traveling in the z-direction; this also sets the velocity),

'Alfvenz-rot' (same as 'Alfven-z', but with rotation),

'Alfven-circ-x' (circularly polarized Alfven wave in x direction),

'Beltrami-x' (x-dependent Beltrami wave),

'Beltrami-y' (y-dependent Beltrami wave),

'Beltrami-z' (z-dependent Beltrami wave),

'Bz(x)' ($B_z \propto \cos(kx)$),

'crazy' (for testing purposes).

'diffrot' ([needs to be documented]),

'fluxrings' (two interlocked magnetic fluxrings; see § ??),

'gaussian-noise' (white noise),

'halfcos-Bx' ([needs to be documented]),

'hor-tube' (horizontal flux tube in $\boldsymbol{B}$, oriented in the y-direction).

'hor-fluxlayer' (horizontal flux layer),

'mag-support' ([needs to be documented]),

'mode' ([needs to be documented]),

'modeb' ([needs to be documented]),

'propto-ux' ([needs to be documented]),

'propto-uy' ([needs to be documented]),

'propto-uz' ([needs to be documented]),

'sinxsinz' ($\sin x \sin z$),

'uniform-Bx' (uniform field in x direction),

'uniform-By' (uniform field in y direction),

'uniform-Bz' (uniform field in z direction),

'zero' (zero field),

initaa2 ['zero']	additional perturbation of magnetic field. Currently valid choices are 'zero' (zero perturbation), 'Beltrami-x' (x-dependent Beltrami wave), 'Beltrami-y' (y-dependent Beltrami wave), 'Beltrami-z' (z-dependent Beltrami wave).
amplaa [0.]	amplitude for some types of initial magnetic fields.
amplaa2 [0.]	amplitude for some types of magnetic field perturbation.
fring{1,2} [0.], Iring{1,2} [0.], Rring{1,2} [1.], wr{1,2} [0.3]	flux, current, outer and inner radius of flux ring 1/2; see Sect. ??.
radius [0.1]	used by some initial fields.
epsilonaa [10^{-2}]	used by some initial fields.
widthaa [0.5]	used by some initial fields.
z0aa [0.]	used by some initial fields.
kx_aa [1.], ky_aa [1.], kz_aa [1.]	wavenumbers used by some initial fields.
lpress_equil [F]	flag for pressure equilibrium (can be used in connection with all initial fields)

Namelist pscalar_init_pars

initlncc ['zero']	initialization of passive scalar (concentration per unit mass, c). Currently valid choices (for $\ln c$) are 'zero' ($\ln c = 0.$), 'gaussian-noise' (white noise), 'wave-x' (wave in x direction), 'wave-y' (wave in y direction), 'wave-z' (wave in z direction), 'tang-discont-z' (Kelvin-Helmholtz instability), 'hor-tube' (horizontal tube in concentration; used as a marker for magnetic flux tubes).

initlncc2 ['zero']	additional perturbation of passive scalar concentration c. Currently valid choices are 'zero' ($\delta \ln c = 0.$), 'wave-x' (add x-directed wave to $\ln c$).
ampllncc [0.1]	amplitude for some types of initial concentration.
ampllncc2 [0.]	amplitude for some types of concentration perturbation.
kx_lncc [1.], ky_lncc [1.], kz_lncc [1.]	wave numbers for some types of initial concentration.
Namelist shear_init_pars	
qshear [0.]	degree of shear for shearing-box simulations (the shearing-periodic boundaries are the x-boundaries and are sheared in the y-direction). The shear velocity is $\mathrm{U} = -q\Omega x\,\hat{\mathrm{y}}$.
Namelist particles_ads_init_pars	
init_ads_mol_frac [0.]	initial adsorbed mole fraction
Namelist particles_surf_init_pars	
init_surf_mol_frac [0.]	initial surface mole fraction
Namelist particles_chem_init_pars	
total_carbon_sites [$1.08e-8$]	carbon sites per surface area [mol/cm]2
Namelist particles_stalker_init_pars	
dstalk [0.1]	times between printout of stalker data
lstalk_xx [F]	particles position
lstalk_vv [F]	particles velocity
lstalk_uu [F]	gas velocity at particles position
lstalk_guu [F]	gas velocity gradient at particles position
lstalk_rho [F]	gas density at particles position
lstalk_grho [F]	gas density gradient at particles position
lstalk_ap [F]	particles diameter
lstalk_bb [T]	magnetic field at particles position
lstalk_relvel [F]	particles relative velocity to gas

1.2 List of runtime parameters for 'run.in'

The following table lists all (at the time of writing, September 2002) namelists used in file 'run.in', with the corresponding parameters and their default values (in square brackets). Default values marked as [start] are taken from 'start.in'. Any variable referred to as a flag can be set to any nonzero value to switch the corresponding feature on. Not all parameters are used for a given scenario. This list is not necessarily up to date; also, in many cases it can only give an idea of the corresponding setup; to get more insight and the latest set of parameters, you need to look at the code.

Once you have changed any of the '*.in' files, you may want to first execute the command pc_-configtest in order to test the correctness of these configuration files, before you apply them in an active simulation run.

Variable [default value]	Meaning
	Namelist run_pars
cvsid [”]	svn identification string, which allows you to keep track of the version of 'run.in'.
ip [14]	(anti-)verbosity level: ip=1 produces lots of additional diagnostic output, ip=14 virtually none.
nt [0]	number of time steps to run. This number can be increased or decreased during the run by touch RELOAD.
it1 [10]	write diagnostic output every it1 time steps (see Sect. ??).
it1d [$it1$]	write averages every it1d time steps (see Sect. ??). it1d has to be greater than or equal to it1.
cdt [0.4]	Courant coefficient for advective time step; see §??.
cdtv [0.08]	Courant coefficient for diffusive time step; see §??.
dt [0.]	time step; if $\neq 0.$, this overwrites the Courant time step. See §?? for a discussion of the latter.
dtmin [10^{-6}]	abort if time step $\delta t < \delta t_{\min}$.
tmax [10^{33}]	don't run time steps beyond this time. Useful if you want to run for a given amount of time, but don't know the necessary number of time steps.
isave [100]	update current snapshot 'var.dat' every isave time steps.
itorder [3]	order of time step (1 for Euler; 2 for 3nd-order, 3 for 3rd-order Runge–Kutta).

dsnap [100.]	save permanent snapshot every dsnap time units to files 'VARN', where N counts from $N = 1$ upward. (This information is stored in the file 'data/tsnap.dat'; see the module wsnaps.f90, which in turn uses the subroutines out1 and out2).
dvid [100.]	write two-dimensional sections for generation of videos every dvid time units (not timesteps; see the subroutines out1 and out2 in the code).
iwig [0]	if $\neq 0$, apply a Nyquist filter (a filter eliminating any signal at the Nyquist frequency, but affecting large scales as little as possible) every iwig time steps to logarithmic density (sometimes necessary with convection simulations).
ix [-1], iy [-1], iz [-1], iz2 [-1]	position of slice planes for video files. Any negative value of some of these variables will be overwritten according to the value of slice_position. See § ??) for details.
slice_position ['p']	symbolic specification of slice position. Currently valid choices are 'p' (periphery of the box) 'm' (middle of the box) 'e' (equator for half-sphere calculations, i. e. x, y centered, z bottom) These settings are overridden by explicitly setting ix, iy, iz or iz2. See § ??) for details.
zbot_slice [value]	z position of slice xy-plane. The value can be any float number inside the z domain. These settings are overridden by explicitly setting ix, iy, iz or iz2. Saved as slice with the suffix xy. See § ??) for details.
ztop_slice [value]	z position of slice xy-plane. The value can be any float number inside the z domain. These settings are overridden by explicitly setting ix, iy, iz or iz2. Saved as slice with the suffix xy2. See § ??) for details.
tavg [0]	averaging time $\tau_{\rm avg}$ for time averages (if $\neq 0$); at the same time, time interval for writing time averages. See § ?? for details.
idx_tavg [$(0, 0, \ldots, 0)$]	indices of variables to time-average. See § ?? for details.
d2davg [100.]	time interval for azimuthal and z-averages, i.e. the averages that produce 2d data. See § ?? for details.

ialive [0]	if $\neq 0$, each processor writes the current time step to 'alive.info' every ialive time steps. This provides the best test that the job is still alive. (This can be used to find out which node has crashed if there is a problem and the run is hanging.)
bcx [('p', 'p', ...)], bcy [('p', 'p', ...)], bcz [('p', 'p', ...)]	boundary conditions. See Sect. ?? for a discussion of where and how to set these.
random_gen [start]	see start parameters, p. ??
lwrite_aux [start]	if set T, auxiliary variables (those calculated at each step, but not evolved mathematically) to 'var.dat' and 'VAR' files after the evolved quantities.

Namelist hydro_run_pars

Omega [0.]	magnitude of angular velocity for Coriolis force (note: the centrifugal force is turned off by default, unless lcentrifugal_force=T is set).
theta [0.]	direction of angular velocity in degrees ($\theta = 0$ for z-direction, $\theta = 90$ for the negative x-direction, corresponding to a box located at the equator of a rotating sphere. Thus, e.g., $\theta = 60$ corresponds to 30° latitude. (Note: prior to April 29, 2007, there was a minus sign in the definition of θ.)
ttransient [0.]	initial time span for which to do something special (transient). Currently just used to smoothly switch on heating [Should be in run_pars, rather than here].
dampu [0.], tdamp [0.], ldamp_fade [F]	damp motions during the initial time interval $0 < t < t_{\rm damp}$ with a damping term $-{\rm dampu}(\boldsymbol{u})$. If ldamp_fade is set, smoothly reduce damping to zero over the second half of the time interval tdamp. Initial velocity damping is useful for situations where initial conditions are far from equilibrium.
dampuint [0.],	weighting of damping external to spherical region (see wdamp, damp_u below).
dampuext [0.],	weighting of damping in internal spherical region (see wdamp, damp_u below).

rdampint [0.],	radius of internal damping region
rdampext [impossible],	radius of external damping region, used in place of former variable rdamp
wdamp [0.2],	permanently damp motions in $\|\boldsymbol{x}\| < r_{\mathrm{dampint}}$ with damping term $-\mathrm{damp}_u int\, \boldsymbol{u}\, \chi(r - r_{\mathrm{dampint}})$ or $\|\boldsymbol{x}\| > r_{\mathrm{dampext}}$ with damping term $-\mathrm{damp}_u ext\, \boldsymbol{u}\, \chi(r - r_{\mathrm{dampext}})$, where $\chi(\cdot)$ is a smooth profile of width wdamp.
ampl_forc [0.],	amplitude of the ux-forcing or uy-forcing on the vertical boundaries that is of the form $u\_x(t) = ampl\_forc * sin(k\_forc * x) * cos(w\_forc * t)$ [must be used in connection with bcx='g' or bcz='g' and force_lower_-bound='vel_time' or force_upper_bound='vel_time']
k_forc [0.],	corresponding horizontal wavenumber
w_forc [0.]	corresponding frequency
Namelist density_run_pars	
cs0 [start],	
rho0 [start],	
gamma [start]	see start parameters, p. ??
cdiffrho [0.]	Coefficient for mass diffusion (diffusion term will be $c_{\mathrm{diffrho}}\, \delta x\, c_{\mathrm{s0}}$.
cs2bot [start],	
cs2top [start]	squared sound speed at bottom and top for boundary condition 'c2'.
lupw_lnrho [.false.]	use 5th-order upwind derivative operator for the advection term $\boldsymbol{u}\cdot\boldsymbol{\nabla} \ln \rho$ to avoid spurious Nyquist signal ('wiggles'); see §??.
Namelist entropy_run_pars	
hcond0 [0.],	
hcond1 [start],	

hcond2 [start]	specific to the solar convection case initss=piecew-poly: heat conductivities K in the individual layers. hcond0 is the value $K_{\rm unst}$ in the unstable layer, hcond1 is the ratio $K_{\rm stab}/K_{\rm unst}$ for the stable layer, and hcond2 is the ratio $K_{\rm top}/K_{\rm unst}$ for the top layer. The function $K(z)$ is not discontinuous, as the transition between the different values is smoothed over the width widthss. If hcond1 or hcond2 are not set, they are calculated according to the polytropic indices of the initial profile, $K \propto m{+}1$.
iheatcond ['K-const']	select type of heat conduction. Currently valid choices are 'K-const' (constant heat conductivity), 'K-profile' (vertical or radial profile), 'chi-const' (constant thermal diffusivity), 'magnetic' (heat conduction by electrons in magnetic field – currently still experimental).
lcalc_heatcond_constchi [F]	flag for assuming thermal diffusivity $\chi = K/(c_p\rho) =$ const, rather than $K =$ const (which is the default). This is currently only correct with 'noionization.f90'. Superseded by iheatcond.
chi [0.]	value of χ when lcalc_heatcond_constchi=T.
widthss [start]	width of transition region between layers. See start parameters, p. ??.
isothtop [start]	flag for isothermal top layer for solar convection case. See start parameters, p. ??.
luminosity [0.], wheat [0.1]	strength and width of heating region.

cooltype ['Temp'] — type of cooling; currently only implemented for spherical geometry. Currently valid choices are

'Temp','cs2' (cool temperature toward c_s^2 = cs2cool) with a cooling term

$$-\mathcal{C} = -c_\mathrm{cool}\frac{c_\mathrm{s}^2 - c_{\mathrm{s\,cool}}^2}{c_{\mathrm{s\,cool}}^2}$$

)

'Temp-rho',cs2-rho (cool temperature toward c_s^2 = cs2cool) with a cooling term

$$-\mathcal{C} = -c_\mathrm{cool}\,\rho\,\frac{c_\mathrm{s}^2 - c_{\mathrm{s\,cool}}^2}{c_{\mathrm{s\,cool}}^2}$$

— this avoids numerical instabilities in low-density regions [currently, the cooling coefficient c_cool ≡cool is not taken into account when the time step is calculated])

'entropy' (cool entropy toward 0.).

cool [0.],
wcool [0.1] — strength c_cool and smoothing width of cooling region.

rcool [1.] — radius of cooling region: cool for $|\boldsymbol{x}| \geq$ rcool.

Fbot [start] — heat flux for bottom boundary condition 'c1'. For polytropic atmospheres, if Fbot is not set, it will be calculated from the value of hcond0 in 'start.x', provided the entropy boundary condition is set to 'c1'.

chi_t [0.] — entropy diffusion coefficient for diffusive term $\partial s/\partial t = \ldots + \chi_\mathrm{t}\nabla^2 s$ in the entropy equation, that can represent some kind of turbulent (sub-grid) mixing. It is probably a bad idea to combine this with heat conduction hcond0 $\neq$ 0.

lupw_ss [.false.] — use 5th-order upwind derivative operator for the advection term $\boldsymbol{u}\cdot\boldsymbol{\nabla}s$ to avoid spurious Nyquist signal ('wiggles'); see §??.

tauheat_buffer [0.] — time scale for heating to target temperature (=TTheat_buffer); zero disables the buffer zone.

zheat_buffer [0.] — z coordinate of the thermal buffer zone. Buffering is active in $|z| >$TTheat_buffer.

dheat_buffer1 [0.] — Inverse thickness of transition to buffered layer.

TTheat_buffer [0.]	target temperature in thermal buffer zone (z direction only).
lhcond_global [F]	flag for calculating the heat conductivity K (and also $\boldsymbol{\nabla} \log K$) globally using the global arrays facility. Only valid when iheatcond='K-profile'.
	Namelist magnetic_run_pars
B_ext [$(0., 0., 0.)$]	uniform background magnetic field (for fully periodic boundary conditions, uniform fields need to be explicitly added, since otherwise the vector potential $\boldsymbol{A}$ has a linear $\boldsymbol{x}$-dependence which is incompatible with periodicity).
lignore_Bext_in_b2 [F] or luse_Bext_in_b2 [T]	add uniform background magnetic field when computing $\boldsymbol{b}^2$ pencils
eta [0.]	magnetic diffusivity $\eta = 1/(\mu_0\sigma)$, where σ is the electric conductivity.
height_eta [0.], eta_out [0.]	 used to add extra diffusivity in a halo region.
eta_int [0.]	used to add extra diffusivity inside sphere of radius r_int.
eta_ext [0.]	used to add extra diffusivity outside sphere of radius r_-ext.
kinflow ['']	set type of flow fixed with 'nohydro'. Currently the only recognized value is 'ABC' for an ABC flow; all other values lead to $\boldsymbol{u} = \boldsymbol{0}$.
kx [1.], ky [1.], kz [1.]	 wave numbers for ABC flow.
ABC_A [1.], ABC_B [1.], ABC_C [1.]	 amplitudes A, B and C for ABC flow.
	Namelist pscalar_run_pars
pscalar_diff [0.]	diffusion for passive scalar concentration c.
tensor_pscalar_diff [0.]	coefficient for non-isotropic diffusion of passive scalar.
reinitialize_lncc [F]	reinitialize the passive scalar to the value of cc_const in start.in at next run
	Namelist forcing_run_pars

iforce [2]	select form of forcing in the equation of motion; currently valid choices are 'zero' (no forcing), 'irrotational' (irrotational forcing), 'helical' (helical forcing), 'fountain' (forcing of "fountain flow"; see Ref. [?]), 'horizontal-shear' (forcing localized horizontal sinusoidal shear). 'variable_gravz' (time-dependent vertical gravity for forcing internal waves),
iforce2 [0]	select form of additional forcing in the equation of motion; valid choices are as for iforce.
force [0.]	amplitude of forcing.
relhel [1.]	helicity of forcing. The parameter relhel corresponds to σ introduced in Sect. ??. ($\sigma = \pm 1$ corresponds to maximum helicity of either sign).
height_ff [0.]	multiply forcing by z-dependent profile of width height_ff (if $\neq 0$) .
r_ff [0.]	if $\neq 0$, multiply forcing by spherical cutoff profile (of radius r_ff) and flip signs of helicity at equatorial plane.
width_ff [0.5]	width of vertical and radial profiles for modifying forcing.
kfountain [5]	horizontal wavenumber of the fountain flow.
fountain [1.]	amplitude of the fountain flow.
omega_ff [1.]	frequency of the cos or sin forcing [e.g. cos(omega_ff*t)].
ampl_ff [1.]	amplitude of forcing in front of cos or sin [e.g. ampl_ff*cos(omega_ff*t)].

Namelist grav_run_pars

zref [start],	
gravz [start],	
grav_profile [start]	see p. ??.
nu_epicycle [start]	see Eq. (??) in Sect. ??.

Namelist viscosity_run_pars

nu [0.]	kinematic viscosity.
nu_hyper2 [0.]	kinematic hyperviscosity (with $\nabla^4 \boldsymbol{u}$).
nu_hyper3 [0.]	kinematic hyperviscosity (with $\nabla^6 \boldsymbol{u}$).
zeta [0.]	bulk viscosity.

ivisc ['nu-const']	select form of viscous term (see §??); currently valid choices are 'nu-const' – viscous force for $\nu = \text{const}$, $\boldsymbol{F}_{\text{visc}} = \nu(\nabla^2\boldsymbol{u} + \frac{1}{3}\boldsymbol{\nabla}\boldsymbol{\nabla}\cdot\boldsymbol{u} + 2\mathsf{S}\cdot\boldsymbol{\nabla}\ln\rho)$ 'rho_nu-const' – viscous force for $\mu \equiv \rho\nu = \text{const}$, $\boldsymbol{F}_{\text{visc}} = (\mu/\rho)(\nabla^2\boldsymbol{u} + \frac{1}{3}\boldsymbol{\nabla}\boldsymbol{\nabla}\cdot\boldsymbol{u})$. With this option, the input parameter nu actually sets the value of μ/ρ_0 (rho0=ρ_0 is another input parameter, see pp. ?? and ??) 'simplified' – simplified viscous force $\boldsymbol{F}_{\text{visc}} = \nu\nabla^2\boldsymbol{u}$

Namelist shear_run_pars	
qshear [start]	See p. ??.
Namelist particles_run_pars	
ldragforce_dust_par [F]	dragforce on particles
ldragforce_gas_par [F]	particle-gas friction force
ldraglaw_steadystate [F]	particle forces only with $\frac{1}{\tau}\Delta v$
lpscalar_sink [F]	particles consume passive scalar
pscalar_sink_rate [0]	volumetric pscalar consumption rate
lbubble [F]	addition of the virtual mass term
Namelist particles_ads_run_pars	
placeholder [start]	placeholder
Namelist particles_surf_run_pars	
lspecies_transfer [T]	Species transfer from solid to fluid phase
Namelist particles_chem_run_pars	
lthiele [T]	Modeling of particle porosity by application of Thiele modulus

1.3 List of parameters for 'print.in'

The following table lists all possible inputs to the file 'print.in' that are documented.

Variable	Meaning
Module 'cdata.f90'	
it	number of time step (since beginning of job only)

t	time t (since start.csh)
dt	time step δt
walltime	wall clock time since start of run.x, in seconds
Rmesh	$R_{\rm mesh}$
Rmesh3	$R_{\rm mesh}^{(3)}$
maxadvec	maxadvec

Module 'hydro.f90'

u2tm	$\left\langle \boldsymbol{u}(t)\cdot\int_0^t \boldsymbol{u}(t')dt'\right\rangle$
uotm	$\left\langle \boldsymbol{u}(t)\cdot\int_0^t \boldsymbol{\omega}(t')dt'\right\rangle$
outm	$\left\langle \boldsymbol{\omega}(t)\cdot\int_0^t \boldsymbol{u}(t')dt'\right\rangle$
fkinzm	$\left\langle\frac{1}{2}\varrho\boldsymbol{u}^2u_z\right\rangle$
u2m	$\langle\boldsymbol{u}^2\rangle$
uxpt	$u_x(x_1,y_1,z_1,t)$
uypt	$u_y(x_1,y_1,z_1,t)$
uzpt	$u_z(x_1,y_1,z_1,t)$
uxp2	$u_x(x_2,y_2,z_2,t)$
uyp2	$u_y(x_2,y_2,z_2,t)$
uzp2	$u_z(x_2,y_2,z_2,t)$
urms	$\langle\boldsymbol{u}^2\rangle^{1/2}$
urmsx	$\langle\boldsymbol{u}^2\rangle^{1/2}$ for the hydro_xaver_range
urmsz	$\langle\boldsymbol{u}^2\rangle^{1/2}$ for the hydro_zaver_range
durms	$\langle\delta\boldsymbol{u}^2\rangle^{1/2}$
umax	$\max(\|\boldsymbol{u}\|)$
umin	$\min(\|\boldsymbol{u}\|)$
uxrms	$\langle u_x^2\rangle^{1/2}$
uyrms	$\left\langle u_y^2\right\rangle^{1/2}$
uzrms	$\langle u_z^2\rangle^{1/2}$
uxmin	$\min(\|u_x\|)$
uymin	$\min(\|u_y\|)$
uzmin	$\min(\|u_z\|)$
uxmax	$\max(\|u_x\|)$
uymax	$\max(\|u_y\|)$
uzmax	$\max(\|u_z\|)$
uxm	$\langle u_x\rangle$
uym	$\langle u_y\rangle$
uzm	$\langle u_z\rangle$
ux2m	$\langle u_x^2\rangle$
uy2m	$\left\langle u_y^2\right\rangle$

uz2m	$\langle u_z^2 \rangle$
ux2ccm	$\langle u_x^2 \cos^2 kz \rangle$
ux2ssm	$\left\langle u_x^2 \sin^2 kz \right\rangle$
uy2ccm	$\left\langle u_y^2 \cos^2 kz \right\rangle$
uy2ssm	$\left\langle u_y^2 \sin^2 kz \right\rangle$
uxuycsm	$\langle u_x u_y \cos kz \sin kz \rangle$
uxuym	$\langle u_x u_y \rangle$
uxuzm	$\langle u_x u_z \rangle$
uyuzm	$\langle u_y u_z \rangle$
umx	$\langle u_x \rangle$
umy	$\langle u_y \rangle$
umz	$\langle u_z \rangle$
omumz	$\left\langle \langle \boldsymbol{W} \rangle_{xy} \cdot \langle \boldsymbol{U} \rangle_{xy} \right\rangle$ (xy-averaged mean cross helicity production)
umamz	$\left\langle \langle \boldsymbol{u} \rangle_{xy} \cdot \langle \boldsymbol{A} \rangle_{xy} \right\rangle$
umbmz	$\left\langle \langle \boldsymbol{U} \rangle_{xy} \cdot \langle \boldsymbol{B} \rangle_{xy} \right\rangle$ (xy-averaged mean cross helicity production)
umxbmz	$\left\langle \langle \boldsymbol{U} \rangle_{xy} \times \langle \boldsymbol{B} \rangle_{xy} \right\rangle_z$ (xy-averaged mean emf)
rux2m	$\langle \rho u_x^2 \rangle$
ruy2m	$\left\langle \rho u_y^2 \right\rangle$
ruz2m	$\langle \rho u_z^2 \rangle$
divum	$\langle \mathrm{div} \boldsymbol{u}) \rangle$
rdivum	$\langle \varrho \mathrm{div} \boldsymbol{u}) \rangle$
divu2m	$\langle (\mathrm{div} \boldsymbol{u})^2 \rangle$
gdivu2m	$\langle (\mathrm{grad}\,\mathrm{div} \boldsymbol{u})^2 \rangle$
u3u21m	$\langle u_3 u_{2,1} \rangle$
u1u32m	$\langle u_1 u_{3,2} \rangle$
u2u13m	$\langle u_2 u_{1,3} \rangle$
u2u31m	$\langle u_2 u_{3,1} \rangle$
u3u12m	$\langle u_3 u_{1,2} \rangle$
u1u23m	$\langle u_1 u_{2,3} \rangle$
ruxm	$\langle \varrho u_x \rangle$ (mean x-momentum density)
ruym	$\langle \varrho u_y \rangle$ (mean y-momentum density)
ruzm	$\langle \varrho u_z \rangle$ (mean z-momentum density)
ruxtot	$\langle \rho \lvert u \rvert \rangle$ (mean absolute x-momentum density)
rumax	$\max(\varrho \lvert \boldsymbol{u} \rvert)$ (maximum modulus of momentum)
ruxuym	$\langle \varrho u_x u_y \rangle$ (mean Reynolds stress)
ruxuzm	$\langle \varrho u_x u_z \rangle$ (mean Reynolds stress)
ruyuzm	$\langle \varrho u_y u_z \rangle$ (mean Reynolds stress)
divrhourms	$\lvert \nabla \cdot (\varrho \boldsymbol{u}) \rvert_{\mathrm{rms}}$

divrhoumax	$\|\nabla \cdot (\varrho \boldsymbol{u})\|_{\max}$
rlxm	$\langle \rho y u_z - z u_y \rangle$
rlym	$\langle \rho z u_x - x u_z \rangle$
rlzm	$\langle \rho x u_y - y u_x \rangle$
rlx2m	$\langle (\rho y u_z - z u_y)^2 \rangle$
rly2m	$\langle (\rho z u_x - x u_z)^2 \rangle$
rlz2m	$\langle (\rho x u_y - y u_x)^2 \rangle$
tot_ang_mom	Total angular momentum in spherical coordinates about the axis.
dtu	$\delta t/[c_{\delta t}\, \delta x/\max \|\mathrm{u}\|]$ (time step relative to advective time step; see § ??)
oum	$\langle \boldsymbol{\omega} \cdot \boldsymbol{u} \rangle$
ou_int	$\int_V \boldsymbol{\omega} \cdot \boldsymbol{u}\, dV$
fum	$\langle \boldsymbol{f} \cdot \boldsymbol{u} \rangle$
odel2um	$\langle \boldsymbol{\omega} \nabla^2 \boldsymbol{u} \rangle$
o2m	$\langle \boldsymbol{\omega}^2 \rangle \equiv \langle (\nabla \times \boldsymbol{u})^2 \rangle$
orms	$\langle \boldsymbol{\omega}^2 \rangle^{1/2}$
omax	$\max(\|\boldsymbol{\omega}\|)$
ox2m	$\langle \omega_x^2 \rangle$
oy2m	$\langle \omega_y^2 \rangle$
oz2m	$\langle \omega_z^2 \rangle$
oxuzxm	$\langle \omega_x u_{z,x} \rangle$
oyuzym	$\langle \omega_y u_{z,y} \rangle$
oxoym	$\langle \omega_x \omega_y \rangle$
oxozm	$\langle \omega_x \omega_z \rangle$
oyozm	$\langle \omega_y \omega_z \rangle$
qfm	$\langle \boldsymbol{q} \cdot \boldsymbol{f} \rangle$
q2m	$\langle \boldsymbol{q}^2 \rangle$
qrms	$\langle \boldsymbol{q}^2 \rangle^{1/2}$
qmax	$\max(\|\boldsymbol{q}\|)$
qom	$\langle \boldsymbol{q} \cdot \boldsymbol{\omega} \rangle$
quxom	$\langle \boldsymbol{q} \cdot (\boldsymbol{u} \times \boldsymbol{\omega}) \rangle$
pvzm	$\langle \omega_z + 2\Omega/\varrho \rangle$ (z component of potential vorticity)
oumphi	$\langle \boldsymbol{\omega} \cdot \boldsymbol{u} \rangle_{\varphi}$
ugurmsx	$\left\langle (\boldsymbol{u} \nabla \boldsymbol{u})^2 \right\rangle^{1/2}$ for the hydro_xaver_range
ugu2m	$\langle \boldsymbol{u} \nabla \boldsymbol{u} \rangle^2$
dudx	$\left\langle \frac{\delta \boldsymbol{u}}{\delta x} \right\rangle$
Marms	$\langle \boldsymbol{u}^2 / c_{\mathrm{s}}^2 \rangle$ (rms Mach number)
Mamax	$\max \|\boldsymbol{u}\| / c_{\mathrm{s}}$ (maximum Mach number)
ekin	$\left\langle \frac{1}{2} \varrho \boldsymbol{u}^2 \right\rangle$

ekintot	$\int_V \frac{1}{2}\varrho \boldsymbol{u}^2\, dV$
uxglnrym	$\langle u_x\partial_y \ln\varrho\rangle$
uyglnrxm	$\langle u_y\partial_x \ln\varrho\rangle$
uzdivum	$\langle u_z\nabla\cdot\boldsymbol{u}\rangle$
uxuydivum	$\langle u_x u_y\nabla\cdot\boldsymbol{u}\rangle$
divuHrms	$(\nabla_{\rm H}\cdot\boldsymbol{u}_{\rm H})^{\rm rms}$
uxxrms	$u_{x,x}^{\rm rms}$
uyyrms	$u_{y,y}^{\rm rms}$
uxzrms	$u_{x,z}^{\rm rms}$
uyzrms	$u_{y,z}^{\rm rms}$
uzyrms	$u_{z,y}^{\rm rms}$
dtF	$\delta t/[c_{\delta t}\,\delta x/\max\|\mathrm{F}\|]$ (time step relative to max force time step; see § ??) $\int u_r(\theta,\phi)Y_\ell^m(\theta,\phi)\sin(\theta)d\theta d\phi$
udpxxm	components of symmetric tensor $\langle u_i\partial_j p + u_j\partial_i p\rangle$

Module ‘density.f90’

rhom	$\langle\varrho\rangle$ (mean density)
rhomxmask	$\langle\varrho\rangle$ for the density_xaver_range
rhomzmask	$\langle\varrho\rangle$ for the density_zaver_range
drho2m	$<(\varrho-\varrho_0)^2>$
drhom	$<\varrho-\varrho_0>$
rhomin	$\min(\rho)$
rhomax	$\max(\rho)$
lnrhomin	$\min(\log\rho)$
lnrhomax	$\max(\log\rho)$
ugrhom	$\langle\boldsymbol{u}\cdot\nabla\varrho\rangle$
uglnrhom	$\langle\boldsymbol{u}\cdot\nabla\ln\varrho\rangle$
totmass	$\int\varrho\, dV$
mass	$\int\varrho\, dV$
vol	$\int dV$ (volume)
grhomax	$\max(\|\nabla\varrho\|)$

Module ‘entropy.f90’

dtc	$\delta t/[c_{\delta t}\,\delta_x/\max c_{\rm s}]$ (time step relative to acoustic time step; see § ??)
ethm	$\langle\varrho e\rangle$ (mean thermal [=internal] energy)
ssruzm	$\langle s\varrho u_z/c_p\rangle$
ssuzm	$\langle s u_z/c_p\rangle$
ssm	$\langle s/c_p\rangle$ (mean entropy)

ss2m	$\langle (s/c_p)^2 \rangle$ (mean squared entropy)
eem	$\langle e \rangle$
ppm	$\langle p \rangle$
csm	$\langle c_\mathrm{s} \rangle$
csmax	$\max(c_\mathrm{s})$
cgam	$\langle c_\gamma \rangle$
pdivum	$\langle p \nabla \cdot \boldsymbol{u} \rangle$
fradbot	$\int F_\mathrm{bot} \cdot d\boldsymbol{S}$
fradtop	$\int F_\mathrm{top} \cdot d\boldsymbol{S}$
TTtop	$\int T_\mathrm{top} d\boldsymbol{S}$
ethtot	$\int_V \varrho e \, dV$ (total thermal [=internal] energy)
dtchi	$\delta t / [c_{\delta t,\mathrm{v}} \, \delta x^2 / \chi_\mathrm{max}]$ (time step relative to time step based on heat conductivity; see § ??)
Hmax	H_max (net heat sources summed see § ??)
tauhmin	H_max (net heat sources summed see § ??)
dtH	$\delta t / [c_{\delta t,\mathrm{s}} \, c_\mathrm{v} T / H_\mathrm{max}]$ (time step relative to time step based on heat sources; see § ??)
yHm	mean hydrogen ionization
yHmax	max of hydrogen ionization
TTm	$\langle T \rangle$
TTmax	T_max
TTmin	T_min
gTmax	$\max(\lvert \nabla T \rvert)$
ssmax	s_max
ssmin	s_min
gTrms	$(\nabla T)_\mathrm{rms}$
gsrms	$(\nabla s)_\mathrm{rms}$
gTxgsrms	$(\nabla T \times \nabla s)_\mathrm{rms}$
fconvm	$\langle c_p \varrho u_z T \rangle$
ufpresm	$\langle -u/\rho \nabla p \rangle$
Kkramersm	$\langle K_\mathrm{kramers} \rangle$
Module ‘magnetic.f90’	
eta_tdep	t-dependent η
ab_int	$\int \boldsymbol{A} \cdot \boldsymbol{B} \, dV$
jb_int	$\int \boldsymbol{j} \cdot \boldsymbol{B} \, dV$
b2tm	$\left\langle \boldsymbol{b}(t) \cdot \int_0^t \boldsymbol{b}(t') dt' \right\rangle$
bjtm	$\left\langle \boldsymbol{b}(t) \cdot \int_0^t \boldsymbol{j}(t') dt' \right\rangle$
jbtm	$\left\langle \boldsymbol{j}(t) \cdot \int_0^t \boldsymbol{b}(t') dt' \right\rangle$

b2ruzm	$\left\langle \boldsymbol{B}^2 \rho u_z \right\rangle$
b2uzm	$\left\langle \boldsymbol{B}^2 u_z \right\rangle$
ubbzm	$\langle (\boldsymbol{u} \cdot \boldsymbol{B}) B_z \rangle$
b1m	$\langle \lvert \boldsymbol{B} \rvert \rangle$
b2m	$\left\langle \boldsymbol{B}^2 \right\rangle$
EEM	$\left\langle \boldsymbol{B}^2 \right\rangle /2$
b4m	$\left\langle \boldsymbol{B}^4 \right\rangle$
bm2	$\max(\boldsymbol{B}^2)$
j2m	$\left\langle \boldsymbol{j}^2 \right\rangle$
jm2	$\max(\boldsymbol{j}^2)$
abm	$\langle \boldsymbol{A} \cdot \boldsymbol{B} \rangle$
abumx	$\langle u_x \boldsymbol{A} \cdot \boldsymbol{B} \rangle$
abumy	$\langle u_y \boldsymbol{A} \cdot \boldsymbol{B} \rangle$
abumz	$\langle u_z \boldsymbol{A} \cdot \boldsymbol{B} \rangle$
abmh	$\langle \boldsymbol{A} \cdot \boldsymbol{B} \rangle$ (temp)
abmn	$\langle \boldsymbol{A} \cdot \boldsymbol{B} \rangle$ (north)
abms	$\langle \boldsymbol{A} \cdot \boldsymbol{B} \rangle$ (south)
abrms	$\langle (\boldsymbol{A} \cdot \boldsymbol{B})^2 \rangle^{1/2}$
jbrms	$\langle (\boldsymbol{j} \cdot \boldsymbol{B})^2 \rangle^{1/2}$
ajm	$\langle \boldsymbol{j} \cdot \boldsymbol{A} \rangle$
jbm	$\langle \boldsymbol{j} \cdot \boldsymbol{B} \rangle$
jbmh	$\langle \boldsymbol{J} \cdot \boldsymbol{B} \rangle$ (temp)
jbmn	$\langle \boldsymbol{J} \cdot \boldsymbol{B} \rangle$ (north)
jbms	$\langle \boldsymbol{J} \cdot \boldsymbol{B} \rangle$ (south)
ubm	$\langle \boldsymbol{u} \cdot \boldsymbol{B} \rangle$
dubrms	$\langle (\boldsymbol{u} - \boldsymbol{B})^2 \rangle^{1/2}$
dobrms	$\langle (\boldsymbol{\omega} - \boldsymbol{B})^2 \rangle^{1/2}$
uxbxm	$\langle u_x B_x \rangle$
uybxm	$\langle u_y B_x \rangle$
uzbxm	$\langle u_z B_x \rangle$
uxbym	$\langle u_x B_y \rangle$
uybym	$\langle u_y B_y \rangle$
uzbym	$\langle u_z B_y \rangle$
uxbzm	$\langle u_x B_z \rangle$
uybzm	$\langle u_y B_z \rangle$
uzbzm	$\langle u_z B_z \rangle$
cosubm	$\langle \boldsymbol{U} \cdot \boldsymbol{B} / (\lvert \boldsymbol{U} \rvert \, \lvert \boldsymbol{B} \rvert) \rangle$
jxbxm	$\langle j_x B_x \rangle$
jybxm	$\langle j_y B_x \rangle$

jzbxm	$\langle j_z B_x \rangle$
jxbym	$\langle j_x B_y \rangle$
jybym	$\langle j_y B_y \rangle$
jzbym	$\langle j_z B_y \rangle$
jxbzm	$\langle j_x B_z \rangle$
jybzm	$\langle j_y B_z \rangle$
jzbzm	$\langle j_z B_z \rangle$
uam	$\langle \boldsymbol{u} \cdot \boldsymbol{A} \rangle$
ujm	$\langle \boldsymbol{u} \cdot \boldsymbol{J} \rangle$
fbm	$\langle \boldsymbol{f} \cdot \boldsymbol{B} \rangle$
fxbxm	$\langle f_x B_x \rangle$
epsM	$\langle \eta \mu_0 \boldsymbol{j}^2 \rangle$
epsAD	$\langle \rho^{-1} t_{\rm AD} (\boldsymbol{J} \times \boldsymbol{B})^2 \rangle$ (heating by ion-neutrals friction)
bxpt	$B_x(x_1, y_1, z_1, t)$
bypt	$B_y(x_1, y_1, z_1, t)$
bzpt	$B_z(x_1, y_1, z_1, t)$
jxpt	$J_x(x_1, y_1, z_1, t)$
jypt	$J_y(x_1, y_1, z_1, t)$
jzpt	$J_z(x_1, y_1, z_1, t)$
Expt	$\mathcal{E}_x(x_1, y_1, z_1, t)$
Eypt	$\mathcal{E}_y(x_1, y_1, z_1, t)$
Ezpt	$\mathcal{E}_z(x_1, y_1, z_1, t)$
axpt	$A_x(x_1, y_1, z_1, t)$
aypt	$A_y(x_1, y_1, z_1, t)$
azpt	$A_z(x_1, y_1, z_1, t)$
bxp2	$B_x(x_2, y_2, z_2, t)$
byp2	$B_y(x_2, y_2, z_2, t)$
bzp2	$B_z(x_2, y_2, z_2, t)$
jxp2	$J_x(x_2, y_2, z_2, t)$
jyp2	$J_y(x_2, y_2, z_2, t)$
jzp2	$J_z(x_2, y_2, z_2, t)$
Exp2	$\mathcal{E}_x(x_2, y_2, z_2, t)$
Eyp2	$\mathcal{E}_y(x_2, y_2, z_2, t)$
Ezp2	$\mathcal{E}_z(x_2, y_2, z_2, t)$
axp2	$A_x(x_2, y_2, z_2, t)$
ayp2	$A_y(x_2, y_2, z_2, t)$
azp2	$A_z(x_2, y_2, z_2, t)$
exabot	$\int \boldsymbol{E} \times \boldsymbol{A} \, dS\vert_{\rm bot}$
exatop	$\int \boldsymbol{E} \times \boldsymbol{A} \, dS\vert_{\rm top}$

emag	$\int_V \frac{1}{2\mu_0}\boldsymbol{B}^2\,dV$
brms	$\left\langle\boldsymbol{B}^2\right\rangle^{1/2}$
bfrms	$\left\langle\boldsymbol{B'}^2\right\rangle^{1/2}$
bf2m	$\left\langle\boldsymbol{B'}^2\right\rangle$
bf4m	$\left\langle\boldsymbol{B'}^4\right\rangle$
bmax	$\max(\lvert\boldsymbol{B}\rvert)$
bxmin	$\min(\lvert B_x\rvert)$
bymin	$\min(\lvert B_y\rvert)$
bzmin	$\min(\lvert B_z\rvert)$
bxmax	$\max(\lvert B_x\rvert)$
bymax	$\max(\lvert B_y\rvert)$
bzmax	$\max(\lvert B_z\rvert)$
bbxmax	$\max(\lvert B_x\rvert) excluding Bv_{ext}$
bbymax	$\max(\lvert B_y\rvert) excluding Bv_{ext}$
bbzmax	$\max(\lvert B_z\rvert) excluding Bv_{ext}$
jxmax	$\max(\lvert jv_x\rvert)$
jymax	$\max(\lvert jv_y\rvert)$
jzmax	$\max(\lvert jv_z\rvert)$
jrms	$\left\langle\boldsymbol{j}^2\right\rangle^{1/2}$
hjrms	$\left\langle\boldsymbol{j}^2\right\rangle^{1/2}$
jmax	$\max(\lvert\boldsymbol{j}\rvert)$
vArms	$\left\langle\boldsymbol{B}^2/\varrho\right\rangle^{1/2}$
vAmax	$\max(\boldsymbol{B}^2/\varrho)^{1/2}$
dtb	$\delta t/[c_{\delta t}\,\delta x/v_{\mathrm{A,max}}]$ (time step relative to Alfvén time step; see § ??)
dteta	$\delta t/[c_{\delta t,\mathrm{v}}\,\delta x^2/\eta_{\max}]$ (time step relative to resistive time step; see § ??)
a2m	$\left\langle\boldsymbol{A}^2\right\rangle$
arms	$\left\langle\boldsymbol{A}^2\right\rangle^{1/2}$
amax	$\max(\lvert\boldsymbol{A}\rvert)$
divarms	$\langle(\nabla\cdot\boldsymbol{A})^2\rangle^{1/2}$
beta1m	$\left\langle\boldsymbol{B}^2/(2\mu_0 p)\right\rangle$ (mean inverse plasma beta)
beta1max	$\max[\boldsymbol{B}^2/(2\mu_0 p)]$ (maximum inverse plasma beta)
betam	$\langle\beta\rangle$
betamax	$\max\beta$
betamin	$\min\beta$
bxm	$\langle B_x\rangle$
bym	$\langle B_y\rangle$
bzm	$\langle B_z\rangle$

bxbym	$\langle B_x B_y \rangle$
bmx	$\left\langle \langle \boldsymbol{B} \rangle_{yz}^2 \right\rangle^{1/2}$ (energy of yz-averaged mean field)
bmy	$\left\langle \langle \boldsymbol{B} \rangle_{xz}^2 \right\rangle^{1/2}$ (energy of xz-averaged mean field)
bmz	$\left\langle \langle \boldsymbol{B} \rangle_{xy}^2 \right\rangle^{1/2}$ (energy of xy-averaged mean field)
bmzS2	$\left\langle \langle \boldsymbol{B}_S \rangle_{xy}^2 \right\rangle$
bmzA2	$\left\langle \langle \boldsymbol{B}_A \rangle_{xy}^2 \right\rangle$
jmx	$\left\langle \langle \boldsymbol{J} \rangle_{yz}^2 \right\rangle^{1/2}$ (energy of yz-averaged mean current density)
jmy	$\left\langle \langle \boldsymbol{J} \rangle_{xz}^2 \right\rangle^{1/2}$ (energy of xz-averaged mean current density)
jmz	$\left\langle \langle \boldsymbol{J} \rangle_{xy}^2 \right\rangle^{1/2}$ (energy of xy-averaged mean current density)
bmzph	Phase of a Beltrami field
bmzphe	Error of phase of a Beltrami field
bsinphz	sine of phase of a Beltrami field
bcosphz	cosine of phase of a Beltrami field
emxamz3	$\left\langle \langle \boldsymbol{E} \rangle_{xy} \times \langle \boldsymbol{A} \rangle_{xy} \right\rangle$ (xy-averaged mean field helicity flux)
embmz	$\left\langle \langle \boldsymbol{E} \rangle_{xy} \cdot \langle \boldsymbol{B} \rangle_{xy} \right\rangle$ (xy-averaged mean field helicity production)
ambmz	$\left\langle \langle \boldsymbol{A} \rangle_{xy} \cdot \langle \boldsymbol{B} \rangle_{xy} \right\rangle$ (magnetic helicity of xy-averaged mean field)
ambmzh	$\left\langle \langle \boldsymbol{A} \rangle_{xy} \cdot \langle \boldsymbol{B} \rangle_{xy} \right\rangle$ (magnetic helicity of xy-averaged mean field, temp)
ambmzn	$\left\langle \langle \boldsymbol{A} \rangle_{xy} \cdot \langle \boldsymbol{B} \rangle_{xy} \right\rangle$ (magnetic helicity of xy-averaged mean field, north)
ambmzs	$\left\langle \langle \boldsymbol{A} \rangle_{xy} \cdot \langle \boldsymbol{B} \rangle_{xy} \right\rangle$ (magnetic helicity of xy-averaged mean field, south)
jmbmz	$\left\langle \langle \boldsymbol{J} \rangle_{xy} \cdot \langle \boldsymbol{B} \rangle_{xy} \right\rangle$ (current helicity of xy-averaged mean field)
Rmmz	$\left\langle \frac{\lvert \boldsymbol{u} \times \boldsymbol{B} \rvert}{\lvert \eta \boldsymbol{J} \rvert} \right\rangle_{xy}$
kx_aa	k_x
kmz	$\left\langle \langle \boldsymbol{J} \rangle_{xy} \cdot \langle \boldsymbol{B} \rangle_{xy} \right\rangle / \left\langle \langle \boldsymbol{B} \rangle_{xy}^2 \right\rangle$
bx2m	$\langle B_x^2 \rangle$
by2m	$\langle B_y^2 \rangle$
bz2m	$\langle B_z^2 \rangle$
uxbm	$\langle \boldsymbol{u} \times \boldsymbol{B} \rangle \cdot \boldsymbol{B}_0 / B_0^2$
jxbm	$\langle \boldsymbol{j} \times \boldsymbol{B} \rangle \cdot \boldsymbol{B}_0 / B_0^2$
magfricmax	$\langle \boldsymbol{j} \times \boldsymbol{B} \rangle \cdot \boldsymbol{B}^2$
b3b21m	$\langle B_3 B_{2,1} \rangle$
b3b12m	$\langle B_3 B_{1,2} \rangle$
b1b32m	$\langle B_1 B_{3,2} \rangle$
b1b23m	$\langle B_1 B_{2,3} \rangle$

b2b13m	$\langle B_2 B_{1,3} \rangle$
b2b31m	$\langle B_2 B_{3,1} \rangle$
uxbmx	$\langle (\boldsymbol{u} \times \boldsymbol{B})_x \rangle$
uxbmy	$\langle (\boldsymbol{u} \times \boldsymbol{B})_y \rangle$
uxbmz	$\langle (\boldsymbol{u} \times \boldsymbol{B})_z \rangle$
jxbmx	$\langle (\boldsymbol{j} \times \boldsymbol{B})_x \rangle$
jxbmy	$\langle (\boldsymbol{j} \times \boldsymbol{B})_y \rangle$
jxbmz	$\langle (\boldsymbol{j} \times \boldsymbol{B})_z \rangle$
examx	$\langle \boldsymbol{E} \times \boldsymbol{A} \rangle \|_x$
examy	$\langle \boldsymbol{E} \times \boldsymbol{A} \rangle \|_y$
examz	$\langle \boldsymbol{E} \times \boldsymbol{A} \rangle \|_z$
exjmx	$\langle \boldsymbol{E} \times \boldsymbol{J} \rangle \|_x$
exjmy	$\langle \boldsymbol{E} \times \boldsymbol{J} \rangle \|_y$
exjmz	$\langle \boldsymbol{E} \times \boldsymbol{J} \rangle \|_z$
dexbmx	$\langle \nabla \times \boldsymbol{E} \times \boldsymbol{B} \rangle \|_x$
dexbmy	$\langle \nabla \times \boldsymbol{E} \times \boldsymbol{B} \rangle \|_y$
dexbmz	$\langle \nabla \times \boldsymbol{E} \times \boldsymbol{B} \rangle \|_z$
phibmx	$\langle \phi \boldsymbol{B} \rangle \|_x$
phibmy	$\langle \phi \boldsymbol{B} \rangle \|_y$
phibmz	$\langle \phi \boldsymbol{B} \rangle \|_z$
b2divum	$\left\langle \boldsymbol{B}^2 \nabla \cdot \boldsymbol{u} \right\rangle$
jdel2am	$\langle \boldsymbol{J} \cdot \nabla^2 \boldsymbol{A}) \rangle$
ujxbm	$\langle \boldsymbol{u} \cdot (\boldsymbol{J} \times \boldsymbol{B}) \rangle$
jxbrmax	$\max(\|\boldsymbol{J} \times \boldsymbol{B}/\rho\|)$
jxbr2m	$\langle (\boldsymbol{J} \times \boldsymbol{B}/\rho)^2 \rangle$
bmxy_rms	$\sqrt{[\langle b_x \rangle_z (x,y)]^2 + [\langle b_y \rangle_z (x,y)]^2 + [\langle b_z \rangle_z (x,y)]^2}$
etasmagm	Mean of Smagorinsky resistivity
etasmagmin	Min of Smagorinsky resistivity
etasmagmax	Max of Smagorinsky resistivity
etavamax	Max of artificial resistivity $\eta \sim v_A$
etajmax	Max of artificial resistivity $\eta \sim J/\sqrt{\rho}$
etaj2max	Max of artificial resistivity $\eta \sim J^2/\rho$
etajrhomax	Max of artificial resistivity $\eta \sim J/\rho$
cosjbm	$\langle \boldsymbol{J} \cdot \boldsymbol{B}/(\|\boldsymbol{J}\| \, \|\boldsymbol{B}\|) \rangle$
jparallelm	Mean value of the component of J parallel to B
jperpm	Mean value of the component of J perpendicular to B
hjparallelm	Mean value of the component of J_{hyper} parallel to B
hjperpm	Mean value of the component of J_{hyper} perpendicular to B
brmsx	$\left\langle \boldsymbol{B}^2 \right\rangle^{1/2}$ for the magnetic_xaver_range

brmsz	$\left\langle \boldsymbol{B}^2 \right\rangle^{1/2}$ for the magnetic_zaver_range
Exmxy	$\langle \mathcal{E}_x \rangle_z$
Eymxy	$\langle \mathcal{E}_y \rangle_z$
Ezmxy	$\langle \mathcal{E}_z \rangle_z$
	Module 'pscalar.f90'
rhoccm	$\langle \varrho c \rangle$
ccmax	$\max(c)$
ccglnrm	$\langle c \nabla_z \varrho \rangle$
	Module '1D_loop.f90'
dtchi2	heatconduction
dtrad	radiative loss from RTV
dtspitzer	Spitzer heat conduction time step
qmax	max of heat flux vector
qrms	rms of heat flux vector
	Module 'advective_gauge.f90'
Lamm	$\langle \Lambda \rangle$
Lampt	$\Lambda(x1, y1, z1)$
Lamp2	$\Lambda(x2, y2, z2)$
Lamrms	$\langle \Lambda^2 \rangle^{1/2}$
Lambzm	$\langle \Lambda B_z \rangle$
Lambzmz	$\langle \Lambda B_z \rangle_{xy}$
gLambm	$\langle \Lambda \boldsymbol{B} \rangle$
apbrms	$\langle (\boldsymbol{A}' \boldsymbol{B})^2 \rangle^{1/2}$
jxarms	$\langle (\boldsymbol{J} \times \boldsymbol{A})^2 \rangle^{1/2}$
jxaprms	$\langle (\boldsymbol{J} \times \boldsymbol{A}')^2 \rangle^{1/2}$
jxgLamrms	$\langle (\boldsymbol{J} \times \nabla \Lambda)^2 \rangle^{1/2}$
gLamrms	$\langle (\nabla \Lambda)^2 \rangle^{1/2}$
divabrms	$\langle [(\nabla \cdot \boldsymbol{A}) \boldsymbol{B}]^2 \rangle^{1/2}$
divapbrms	$\langle [(\nabla \cdot \boldsymbol{A}') \boldsymbol{B}]^2 \rangle^{1/2}$
d2Lambrms	$\langle [(\nabla^2 \Lambda) \boldsymbol{B}]^2 \rangle^{1/2}$
d2Lamrms	$\langle [\nabla^2 \Lambda]^2 \rangle^{1/2}$
	Module 'anelastic.f90'
rhom	$\langle \varrho \rangle$ (mean density)
ugrhom	$\langle \boldsymbol{u} \cdot \nabla \varrho \rangle$
mass	$\int \varrho \, dV$
divrhoum	$\langle \nabla \cdot (\varrho \boldsymbol{u}) \rangle$

divrhourms	$\lvert\nabla\cdot(\varrho\boldsymbol{u})\rvert_{\rm rms}$
divrhoumax	$\lvert\nabla\cdot(\varrho\boldsymbol{u})\rvert_{\max}$
Module 'bfield.f90'	
bmax	$\max B$
bmin	$\min B$
brms	$\langle B^2\rangle^{1/2}$
bm	$\langle B\rangle$
b2m	$\langle B^2\rangle$
bxmax	$\max\lvert B_x\rvert$
bymax	$\max\lvert B_y\rvert$
bzmax	$\max\lvert B_z\rvert$
bxm	$\langle B_x\rangle$
bym	$\langle B_y\rangle$
bzm	$\langle B_z\rangle$
bx2m	$\langle B_x^2\rangle$
by2m	$\langle B_y^2\rangle$
bz2m	$\langle B_z^2\rangle$
bxbym	$\langle B_xB_y\rangle$
bxbzm	$\langle B_xB_z\rangle$
bybzm	$\langle B_yB_z\rangle$
dbxmax	$\max\lvert B_x-B_{{\rm ext},x}\rvert$
dbymax	$\max\lvert B_y-B_{{\rm ext},y}\rvert$
dbzmax	$\max\lvert B_z-B_{{\rm ext},z}\rvert$
dbxm	$\langle B_x-B_{{\rm ext},x}\rangle$
dbym	$\langle B_y-B_{{\rm ext},y}\rangle$
dbzm	$\langle B_z-B_{{\rm ext},z}\rangle$
dbx2m	$\langle(B_x-B_{{\rm ext},x})^2\rangle$
dby2m	$\langle(B_y-B_{{\rm ext},y})^2\rangle$
dbz2m	$\langle(B_z-B_{{\rm ext},z})^2\rangle$
jmax	$\max J$
jmin	$\min J$
jrms	$\langle J^2\rangle^{1/2}$
jm	$\langle J\rangle$
j2m	$\langle J^2\rangle$
jxmax	$\max\lvert J_x\rvert$
jymax	$\max\lvert J_y\rvert$
jzmax	$\max\lvert J_z\rvert$
jxm	$\langle J_x\rangle$

jym	$\langle J_y \rangle$
jzm	$\langle J_z \rangle$
jx2m	$\langle J_x^2 \rangle$
jy2m	$\langle J_y^2 \rangle$
jz2m	$\langle J_z^2 \rangle$
divbmax	$\max \lvert \nabla \cdot \boldsymbol{B} \rvert$
divbrms	$\langle (\nabla \cdot \boldsymbol{B})^2 \rangle^{1/2}$
betamax	$\max \beta$
betamin	$\min \beta$
betam	$\langle \beta \rangle$
vAmax	$\max v_A$
vAmin	$\min v_A$
vAm	$\langle v_A \rangle$
	Module 'chemistry.f90'
dtchem	dt_{chem}
	Module 'chemistry_simple.f90'
dtchem	dt_{chem}
	Module 'chiral_mhd.f90'
mu5m	$\langle \mu_5 \rangle$
mu5rms	$\langle \mu_5^2 \rangle^{1/2}$
gmu5rms	$\langle (\nabla \mu_5)^2 \rangle^{1/2}$
gmu5mx	$\langle \nabla \mu_5 \rangle_x$
gmu5my	$\langle \nabla \mu_5 \rangle_y$
gmu5mz	$\langle \nabla \mu_5 \rangle_z$
bgmu5rms	$\langle (\boldsymbol{B} \cdot \nabla \mu_5)^2 \rangle^{1/2}$
mu5bjm	$\langle \mu_5 ((\nabla \times \boldsymbol{B}) \cdot \boldsymbol{B}) \rangle$
mu5bjrms	$\langle (\mu_5 ((\nabla \times \boldsymbol{B}) \cdot \boldsymbol{B}))^2 \rangle^{1/2}$
dt_mu5_1	$\min(\mu_5/\boldsymbol{B}^2)\delta x/(\lambda\eta)$
dt_mu5_2	$(\lambda\eta \min(\boldsymbol{B}^2))^{-1}$
dt_mu5_3	$\delta x^2/D_5$
dt_bb_1	$\delta x/(\eta \max(\mu_5))$
dt_chiral	total time-step contribution from chiral MHD
mu5bxm	$\langle \mu_5 B_x \rangle$
mu5b2m	$\langle \mu_5 B^2 \rangle$
	Module 'coronae.f90'

dtchi2	$\delta t/[c_{\delta t,\mathrm{v}}\,\delta x^2/\chi_{\max}]$ (time step relative to time step based on heat conductivity; see § ??)
dtspitzer	Spitzer heat conduction time step
dtrad	radiative loss from RTV
Module 'cosmicray_current.f90'	
ekincr	$\left\langle\frac{1}{2}\varrho\boldsymbol{u}_{\mathrm{cr}}^2\right\rangle$
ethmcr	$\langle\varrho_{\mathrm{cr}}e_{\mathrm{cr}}\rangle$
Module 'density_stratified.f90'	
mass	$\int\rho\,d^3x$
rhomin	$\min\|\rho\|$
rhomax	$\max\|\rho\|$
drhom	$\langle\Delta\rho/\rho_0\rangle$
drho2m	$\langle(\Delta\rho/\rho_0)^2\rangle$
drhorms	$\langle\Delta\rho/\rho_0\rangle_{rms}$
drhomax	$\max\|\Delta\rho/\rho_0\|$
Module 'detonate.f90'	
detn	Number of detonated sites (summed over time steps between adjacent outputs)
dettot	Total energy input (summed over time steps between adjacent outputs)
Module 'dustdensity.f90'	
KKm	$\sum\mathcal{T}_k^{\mathrm{coag}}$
KK2m	$\sum\mathcal{T}_k^{\mathrm{coag}}$
MMxm	$\sum\mathcal{M}_{k,\mathrm{coag}}^x$
MMym	$\sum\mathcal{M}_{k,\mathrm{coag}}^y$
MMzm	$\sum\mathcal{M}_{k,\mathrm{coag}}^z$
Module 'entropy_anelastic.f90'	
dtc	$\delta t/[c_{\delta t}\,\delta_x/\max c_{\mathrm{s}}]$ (time step relative to acoustic time step; see § ??)
ethm	$\langle\varrho e\rangle$ (mean thermal [=internal] energy)
ssm	$\langle s/c_p\rangle$ (mean entropy)
ss2m	$\langle(s/c_p)^2\rangle$ (mean squared entropy)
eem	$\langle e\rangle$
ppm	$\langle p\rangle$
csm	$\langle c_{\mathrm{s}}\rangle$

pdivum	$\langle p\nabla\boldsymbol{u}\rangle$
fradbot	$\int F_{\rm bot}\cdot d\boldsymbol{S}$
fradtop	$\int F_{\rm top}\cdot d\boldsymbol{S}$
TTtop	$\int T_{\rm top} d\boldsymbol{S}$
ethtot	$\int_V \varrho e\, dV$ (total thermal [=internal] energy)
dtchi	$\delta t/[c_{\delta t,{\rm v}}\,\delta x^2/\chi_{\rm max}]$ (time step relative to time step based on heat conductivity; see § ??)
ssmxy	$\langle s\rangle_z$
ssmxz	$\langle s\rangle_y$
	Module 'gravitational_waves.f90'
hhT2m	$\langle h_{\rm T}^2\rangle$
hhX2m	$\langle h_{\rm X}^2\rangle$
hhThhXm	$\langle h_{\rm T}h_{\rm X}\rangle$
ggTpt	$g_{\rm T}(x_1,y_1,z_1,t)$
strTpt	$S_{\rm T}(x_1,y_1,z_1,t)$
strXpt	$S_{\rm X}(x_1,y_1,z_1,t)$
	Module 'gravitational_waves_hij6.f90'
h22rms	$h_{22}^{\rm rms}$
h33rms	$h_{33}^{\rm rms}$
h23rms	$h_{23}^{\rm rms}$
g11pt	$g_{11}(x_1,y_1,z_1,t)$
g22pt	$g_{22}(x_1,y_1,z_1,t)$
g33pt	$g_{33}(x_1,y_1,z_1,t)$
g12pt	$g_{12}(x_1,y_1,z_1,t)$
g23pt	$g_{23}(x_1,y_1,z_1,t)$
g31pt	$g_{31}(x_1,y_1,z_1,t)$
hhTpt	$h_T(x_1,y_1,z_1,t)$
hhXpt	$h_X(x_1,y_1,z_1,t)$
ggTpt	$\dot{h}_T(x_1,y_1,z_1,t)$
ggXpt	$\dot{h}_X(x_1,y_1,z_1,t)$
hhTp2	$h_T(x_1,y_1,z_1,t)$
hhXp2	$h_X(x_1,y_1,z_1,t)$
ggTp2	$\dot{h}_T(x_1,y_1,z_1,t)$
ggXp2	$\dot{h}_X(x_1,y_1,z_1,t)$
hrms	$\langle h_T^2+h_X^2\rangle^{1/2}$
EEGW	$\langle g_T^2+g_X^2\rangle\, c^2/(32\pi G)$
gg2m	$\langle g_T^2+g_X^2\rangle$

hhT2m	$\langle h_T^2 \rangle$
hhX2m	$\langle h_X^2 \rangle$
hhTXm	$\langle h_T h_X \rangle$
ggT2m	$\langle g_T^2 \rangle$
ggX2m	$\langle g_X^2 \rangle$
ggTXm	$\langle g_T g_X \rangle$
ggTm	$\langle g_T \rangle$
ggXm	$\langle g_X \rangle$
hijij2m	$\langle h_{ij,ij}^2 \rangle$
gijij2m	$\langle g_{ij,ij}^2 \rangle$
Module 'gravity_simple.f90'	
epot	$\langle \varrho\Phi_{\rm grav} \rangle$ (mean potential energy)
epottot	$\int_V \varrho\Phi_{\rm grav} dV$ (total potential energy)
ugm	$\langle \boldsymbol{u} \cdot \boldsymbol{g} \rangle$
Module 'heatflux.f90'	
dtspitzer	Spitzer heat conduction time step
dtq	heatflux time step
dtq2	heatflux time step due to tau
qmax	$\max(\lvert\boldsymbol{q}\rvert)$
qxmin	$\min(\lvert q_x\rvert)$
qymin	$\min(\lvert q_y\rvert)$
qzmin	$\min(\lvert q_z\rvert)$
qxmax	$\max(\lvert q_x\rvert)$
qymax	$\max(\lvert q_y\rvert)$
qzmax	$\max(\lvert q_z\rvert)$
qrms	rms of heat flux vector
qsatmin	minimum of qsat/qabs
qsatrms	rms of qsat/abs
Module 'lorenz_gauge.f90'	
phim	$\langle \phi \rangle$
phipt	$\phi(x1, y1, z1)$
phip2	$\phi(x2, y2, z2)$
phibzm	$\langle \phi B_z \rangle$
phibzmz	$\langle \phi B_z \rangle_{xy}$
Module 'magnetic_shearboxJ.f90'	
ab_int	$\int \boldsymbol{A} \cdot \boldsymbol{B}\, dV$

jb_int	$\int \boldsymbol{j} \cdot \boldsymbol{B}\, dV$
b2tm	$\left\langle \boldsymbol{b}(t) \cdot \int_0^t \boldsymbol{b}(t')dt' \right\rangle$
bjtm	$\left\langle \boldsymbol{b}(t) \cdot \int_0^t \boldsymbol{j}(t')dt' \right\rangle$
jbtm	$\left\langle \boldsymbol{j}(t) \cdot \int_0^t \boldsymbol{b}(t')dt' \right\rangle$
b2ruzm	$\left\langle \boldsymbol{B}^2 \rho u_z \right\rangle$
b2uzm	$\left\langle \boldsymbol{B}^2 u_z \right\rangle$
ubbzm	$\langle (\boldsymbol{u} \cdot \boldsymbol{B}) B_z \rangle$
b1m	$\langle \lvert \boldsymbol{B} \rvert \rangle$
b2m	$\left\langle \boldsymbol{B}^2 \right\rangle$
bm2	$\max(\boldsymbol{B}^2)$
j2m	$\left\langle \boldsymbol{j}^2 \right\rangle$
jm2	$\max(\boldsymbol{j}^2)$
abm	$\langle \boldsymbol{A} \cdot \boldsymbol{B} \rangle$
abumx	$\langle u_x \boldsymbol{A} \cdot \boldsymbol{B} \rangle$
abumy	$\langle u_y \boldsymbol{A} \cdot \boldsymbol{B} \rangle$
abumz	$\langle u_z \boldsymbol{A} \cdot \boldsymbol{B} \rangle$
abmh	$\langle \boldsymbol{A} \cdot \boldsymbol{B} \rangle$ (temp)
abmn	$\langle \boldsymbol{A} \cdot \boldsymbol{B} \rangle$ (north)
abms	$\langle \boldsymbol{A} \cdot \boldsymbol{B} \rangle$ (south)
abrms	$\langle (\boldsymbol{A} \cdot \boldsymbol{B})^2 \rangle^{1/2}$
jbrms	$\langle (\boldsymbol{j} \cdot \boldsymbol{B})^2 \rangle^{1/2}$
ajm	$\langle \boldsymbol{j} \cdot \boldsymbol{A} \rangle$
jbm	$\langle \boldsymbol{j} \cdot \boldsymbol{B} \rangle$
jbmh	$\langle \boldsymbol{J} \cdot \boldsymbol{B} \rangle$ (temp)
jbmn	$\langle \boldsymbol{J} \cdot \boldsymbol{B} \rangle$ (north)
jbms	$\langle \boldsymbol{J} \cdot \boldsymbol{B} \rangle$ (south)
ubm	$\langle \boldsymbol{u} \cdot \boldsymbol{B} \rangle$
dubrms	$\langle (\boldsymbol{u} - \boldsymbol{B})^2 \rangle^{1/2}$
dobrms	$\langle (\boldsymbol{\omega} - \boldsymbol{B})^2 \rangle^{1/2}$
uxbxm	$\langle u_x B_x \rangle$
uybxm	$\langle u_y B_x \rangle$
uzbxm	$\langle u_z B_x \rangle$
uxbym	$\langle u_x B_y \rangle$
uybym	$\langle u_y B_y \rangle$
uzbym	$\langle u_z B_y \rangle$
uxbzm	$\langle u_x B_z \rangle$
uybzm	$\langle u_y B_z \rangle$
uzbzm	$\langle u_z B_z \rangle$

cosubm	$\langle \boldsymbol{U} \cdot \boldsymbol{B} / (\lvert\boldsymbol{U}\rvert\,\lvert\boldsymbol{B}\rvert) \rangle$
jxbxm	$\langle j_x B_x \rangle$
jybxm	$\langle j_y B_x \rangle$
jzbxm	$\langle j_z B_x \rangle$
jxbym	$\langle j_x B_y \rangle$
jybym	$\langle j_y B_y \rangle$
jzbym	$\langle j_z B_y \rangle$
jxbzm	$\langle j_x B_z \rangle$
jybzm	$\langle j_y B_z \rangle$
jzbzm	$\langle j_z B_z \rangle$
uam	$\langle \boldsymbol{u} \cdot \boldsymbol{A} \rangle$
ujm	$\langle \boldsymbol{u} \cdot \boldsymbol{J} \rangle$
fbm	$\langle \boldsymbol{f} \cdot \boldsymbol{B} \rangle$
fxbxm	$\langle f_x B_x \rangle$
epsM	$\left\langle \eta \mu_0 \boldsymbol{j}^2 \right\rangle$
epsAD	$\langle \rho^{-1} t_{\rm AD} (\boldsymbol{J} \times \boldsymbol{B})^2 \rangle$ (heating by ion-neutrals friction)
bxpt	$B_x(x_1, y_1, z_1, t)$
bypt	$B_y(x_1, y_1, z_1, t)$
bzpt	$B_z(x_1, y_1, z_1, t)$
jxpt	$J_x(x_1, y_1, z_1, t)$
jypt	$J_y(x_1, y_1, z_1, t)$
jzpt	$J_z(x_1, y_1, z_1, t)$
Expt	$\mathcal{E}_x(x_1, y_1, z_1, t)$
Eypt	$\mathcal{E}_y(x_1, y_1, z_1, t)$
Ezpt	$\mathcal{E}_z(x_1, y_1, z_1, t)$
axpt	$A_x(x_1, y_1, z_1, t)$
aypt	$A_y(x_1, y_1, z_1, t)$
azpt	$A_z(x_1, y_1, z_1, t)$
bxp2	$B_x(x_2, y_2, z_2, t)$
byp2	$B_y(x_2, y_2, z_2, t)$
bzp2	$B_z(x_2, y_2, z_2, t)$
jxp2	$J_x(x_2, y_2, z_2, t)$
jyp2	$J_y(x_2, y_2, z_2, t)$
jzp2	$J_z(x_2, y_2, z_2, t)$
Exp2	$\mathcal{E}_x(x_2, y_2, z_2, t)$
Eyp2	$\mathcal{E}_y(x_2, y_2, z_2, t)$
Ezp2	$\mathcal{E}_z(x_2, y_2, z_2, t)$
axp2	$A_x(x_2, y_2, z_2, t)$
ayp2	$A_y(x_2, y_2, z_2, t)$

azp2	$A_z(x_2, y_2, z_2, t)$
exabot	$\int \boldsymbol{E} \times \boldsymbol{A} \, dS\|_{\rm bot}$
exatop	$\int \boldsymbol{E} \times \boldsymbol{A} \, dS\|_{\rm top}$
emag	$\int_V \frac{1}{2\mu_0} \boldsymbol{B}^2 \, dV$
brms	$\left\langle \boldsymbol{B}^2 \right\rangle^{1/2}$
bfrms	$\left\langle \boldsymbol{B'}^2 \right\rangle^{1/2}$
bmax	$\max(\|\boldsymbol{B}\|)$
bxmin	$\min(\|B_x\|)$
bymin	$\min(\|B_y\|)$
bzmin	$\min(\|B_z\|)$
bxmax	$\max(\|B_x\|)$
bymax	$\max(\|B_y\|)$
bzmax	$\max(\|B_z\|)$
bbxmax	$\max(\|B_x\|) excluding Bv_{ext}$
bbymax	$\max(\|B_y\|) excluding Bv_{ext}$
bbzmax	$\max(\|B_z\|) excluding Bv_{ext}$
jxmax	$\max(\|jv_x\|)$
jymax	$\max(\|jv_y\|)$
jzmax	$\max(\|jv_z\|)$
jrms	$\left\langle \boldsymbol{j}^2 \right\rangle^{1/2}$
hjrms	$\left\langle \boldsymbol{j}^2 \right\rangle^{1/2}$
jmax	$\max(\|\boldsymbol{j}\|)$
vArms	$\left\langle \boldsymbol{B}^2/\varrho \right\rangle^{1/2}$
vAmax	$\max(\boldsymbol{B}^2/\varrho)^{1/2}$
dtb	$\delta t/[c_{\delta t} \, \delta x/v_{\rm A,max}]$ (time step relative to Alfvén time step; see § ??)
dteta	$\delta t/[c_{\delta t,\rm v} \, \delta x^2/\eta_{\rm max}]$ (time step relative to resistive time step; see § ??)
a2m	$\left\langle \boldsymbol{A}^2 \right\rangle$
arms	$\left\langle \boldsymbol{A}^2 \right\rangle^{1/2}$
amax	$\max(\|\boldsymbol{A}\|)$
divarms	$\langle (\nabla \cdot \boldsymbol{A})^2 \rangle^{1/2}$
beta1m	$\left\langle \boldsymbol{B}^2/(2\mu_0 p) \right\rangle$ (mean inverse plasma beta)
beta1max	$\max[\boldsymbol{B}^2/(2\mu_0 p)]$ (maximum inverse plasma beta)
betam	$\langle \beta \rangle$
betamax	$\max \beta$
betamin	$\min \beta$
bxm	$\langle B_x \rangle$
bym	$\langle B_y \rangle$

bzm	$\langle B_z \rangle$
bxbym	$\langle B_x B_y \rangle$
bmx	$\left\langle \langle \boldsymbol{B} \rangle_{yz}^2 \right\rangle^{1/2}$ (energy of yz-averaged mean field)
bmy	$\langle \langle \boldsymbol{B} \rangle_{xz}^2 \rangle^{1/2}$ (energy of xz-averaged mean field)
bmz	$\left\langle \langle \boldsymbol{B} \rangle_{xy}^2 \right\rangle^{1/2}$ (energy of xy-averaged mean field)
bmzS2	$\left\langle \langle \boldsymbol{B}_S \rangle_{xy}^2 \right\rangle$
bmzA2	$\left\langle \langle \boldsymbol{B}_A \rangle_{xy}^2 \right\rangle$
jmx	$\left\langle \langle \boldsymbol{J} \rangle_{yz}^2 \right\rangle^{1/2}$ (energy of yz-averaged mean current density)
jmy	$\langle \langle \boldsymbol{J} \rangle_{xz}^2 \rangle^{1/2}$ (energy of xz-averaged mean current density)
jmz	$\left\langle \langle \boldsymbol{J} \rangle_{xy}^2 \right\rangle^{1/2}$ (energy of xy-averaged mean current density)
bmzph	Phase of a Beltrami field
bmzphe	Error of phase of a Beltrami field
bsinphz	sine of phase of a Beltrami field
bcosphz	cosine of phase of a Beltrami field
emxamz3	$\left\langle \langle \boldsymbol{E} \rangle_{xy} \times \langle \boldsymbol{A} \rangle_{xy} \right\rangle$ (xy-averaged mean field helicity flux)
embmz	$\left\langle \langle \boldsymbol{E} \rangle_{xy} \cdot \langle \boldsymbol{B} \rangle_{xy} \right\rangle$ (xy-averaged mean field helicity production)
ambmz	$\left\langle \langle \boldsymbol{A} \rangle_{xy} \cdot \langle \boldsymbol{B} \rangle_{xy} \right\rangle$ (magnetic helicity of xy-averaged mean field)
ambmzh	$\left\langle \langle \boldsymbol{A} \rangle_{xy} \cdot \langle \boldsymbol{B} \rangle_{xy} \right\rangle$ (magnetic helicity of xy-averaged mean field, temp)
ambmzn	$\left\langle \langle \boldsymbol{A} \rangle_{xy} \cdot \langle \boldsymbol{B} \rangle_{xy} \right\rangle$ (magnetic helicity of xy-averaged mean field, north)
ambmzs	$\left\langle \langle \boldsymbol{A} \rangle_{xy} \cdot \langle \boldsymbol{B} \rangle_{xy} \right\rangle$ (magnetic helicity of xy-averaged mean field, south)
jmbmz	$\left\langle \langle \boldsymbol{J} \rangle_{xy} \cdot \langle \boldsymbol{B} \rangle_{xy} \right\rangle$ (current helicity of xy-averaged mean field)
kx_aa	k_x
kmz	$\left\langle \langle \boldsymbol{J} \rangle_{xy} \cdot \langle \boldsymbol{B} \rangle_{xy} \right\rangle / \left\langle \langle \boldsymbol{B} \rangle_{xy}^2 \right\rangle$
bx2m	$\langle B_x^2 \rangle$
by2m	$\langle B_y^2 \rangle$
bz2m	$\langle B_z^2 \rangle$
uxbm	$\langle \boldsymbol{u} \times \boldsymbol{B} \rangle \cdot \boldsymbol{B}_0 / B_0^2$
jxbm	$\langle \boldsymbol{j} \times \boldsymbol{B} \rangle \cdot \boldsymbol{B}_0 / B_0^2$
magfricmax	Magneto-Frictional velocity $\langle \boldsymbol{j} \times \boldsymbol{B} \rangle \cdot \boldsymbol{B}^2$
b3b21m	$\langle B_3 B_{2,1} \rangle$
b3b12m	$\langle B_3 B_{1,2} \rangle$
b1b32m	$\langle B_1 B_{3,2} \rangle$
b1b23m	$\langle B_1 B_{2,3} \rangle$

b2b13m	$\langle B_2 B_{1,3} \rangle$
b2b31m	$\langle B_2 B_{3,1} \rangle$
uxbmx	$\langle (\boldsymbol{u} \times \boldsymbol{B})_x \rangle$
uxbmy	$\langle (\boldsymbol{u} \times \boldsymbol{B})_y \rangle$
uxbmz	$\langle (\boldsymbol{u} \times \boldsymbol{B})_z \rangle$
jxbmx	$\langle (\boldsymbol{j} \times \boldsymbol{B})_x \rangle$
jxbmy	$\langle (\boldsymbol{j} \times \boldsymbol{B})_y \rangle$
jxbmz	$\langle (\boldsymbol{j} \times \boldsymbol{B})_z \rangle$
examx	$\langle \boldsymbol{E} \times \boldsymbol{A} \rangle \vert_x$
examy	$\langle \boldsymbol{E} \times \boldsymbol{A} \rangle \vert_y$
examz	$\langle \boldsymbol{E} \times \boldsymbol{A} \rangle \vert_z$
exjmx	$\langle \boldsymbol{E} \times \boldsymbol{J} \rangle \vert_x$
exjmy	$\langle \boldsymbol{E} \times \boldsymbol{J} \rangle \vert_y$
exjmz	$\langle \boldsymbol{E} \times \boldsymbol{J} \rangle \vert_z$
dexbmx	$\langle \nabla \times \boldsymbol{E} \times \boldsymbol{B} \rangle \vert_x$
dexbmy	$\langle \nabla \times \boldsymbol{E} \times \boldsymbol{B} \rangle \vert_y$
dexbmz	$\langle \nabla \times \boldsymbol{E} \times \boldsymbol{B} \rangle \vert_z$
phibmx	$\langle \phi \boldsymbol{B} \rangle \vert_x$
phibmy	$\langle \phi \boldsymbol{B} \rangle \vert_y$
phibmz	$\langle \phi \boldsymbol{B} \rangle \vert_z$
b2divum	$\left\langle \boldsymbol{B}^2 \nabla \cdot \boldsymbol{u} \right\rangle$
ujxbm	$\langle \boldsymbol{u} \cdot (\boldsymbol{J} \times \boldsymbol{B}) \rangle$
jxbrmax	$\max(\vert \boldsymbol{J} \times \boldsymbol{B}/\rho \vert)$
jxbr2m	$\langle (\boldsymbol{J} \times \boldsymbol{B}/\rho)^2 \rangle$
bmxy_rms	$\sqrt{[\langle b_x \rangle_z (x,y)]^2 + [\langle b_y \rangle_z (x,y)]^2 + [\langle b_z \rangle_z (x,y)]^2}$
etasmagm	Mean of Smagorinsky resistivity
etasmagmin	Min of Smagorinsky resistivity
etasmagmax	Max of Smagorinsky resistivity
etavamax	Max of artificial resistivity $\eta \sim v_A$
etajmax	Max of artificial resistivity $\eta \sim J/\sqrt{\rho}$
etaj2max	Max of artificial resistivity $\eta \sim J^2/\rho$
etajrhomax	Max of artificial resistivity $\eta \sim J/\rho$
cosjbm	$\langle \boldsymbol{J} \cdot \boldsymbol{B}/(\vert \boldsymbol{J} \vert \, \vert \boldsymbol{B} \vert) \rangle$
jparallelm	Mean value of the component of J parallel to B
jperpm	Mean value of the component of J perpendicular to B
hjparallelm	Mean value of the component of $J_{\rm hyper}$ parallel to B
hjperpm	Mean value of the component of $J_{\rm hyper}$ perpendicular to B
brmsx	$\left\langle \boldsymbol{B}^2 \right\rangle^{1/2}$ for the magnetic_xaver_range
brmsz	$\left\langle \boldsymbol{B}^2 \right\rangle^{1/2}$ for the magnetic_zaver_range

Exmxy	$\langle\mathcal{E}_x\rangle_z$
Eymxy	$\langle\mathcal{E}_y\rangle_z$
Ezmxy	$\langle\mathcal{E}_z\rangle_z$
Module ‘meanfield.f90’	
qsm	$\left\langle q_p(\overline{B})\right\rangle$
qpm	$\left\langle q_p(\overline{B})\right\rangle$
qem	$\left\langle q_e(\overline{B})\right\rangle$, in the paper referred to as $\left\langle q_g(\overline{B})\right\rangle$
qam	$\left\langle q_a(\overline{B})\right\rangle$
alpm	$\langle\alpha\rangle$
etatm	$\langle\eta_{\rm t}\rangle$
EMFmz1	$\langle\mathcal{E}\rangle_{xy}\|_x$
EMFmz2	$\langle\mathcal{E}\rangle_{xy}\|_y$
EMFmz3	$\langle\mathcal{E}\rangle_{xy}\|_z$
EMFdotBm	$\langle\mathcal{E}\cdot\boldsymbol{B}\rangle$
EMFdotB_int	$\int\mathcal{E}\cdot\boldsymbol{B}dV$
Module ‘meanfield_demfdt.f90’	
EMFrms	$(\langle\mathcal{E}\rangle)_{\rm rms}$
EMFmax	$\max(\langle\mathcal{E}\rangle)$
EMFmin	$\min(\langle\mathcal{E}\rangle)$
Module ‘noentropy.f90’	
dtc	$\delta t/[c_{\delta t}\,\delta_x/\max c_{\rm s}]$ (time step relative to acoustic time step; see § ??)
ethm	$\langle\varrho e\rangle$ (mean thermal [=internal] energy)
pdivum	$\langle p\nabla\boldsymbol{u}\rangle$
Module ‘particles_caustics.f90’	
TrSigmapm	$\langle{\rm Tr}\,[\sigma]\rangle$
blowupm	Mean no. of times σ falls below cutoff
Module ‘particles_chemistry.f90’	
Shchm	meanparticleSherwoodnumber
Module ‘particles_dust.f90’	
xpm	x_{part}
xpmin	x_{part}
xpmax	x_{part}
xp2m	x^2_{part}
vrelpabsm	Absolutevalueofmeanrelativevelocity

vpxm	u_{part}
vpx2m	u^2_{part}
ekinp	$E_{kin,part}$
vpxmax	$MAX(u_{part})$
vpxmin	$MIN(u_{part})$
npm	meanparticlenumberdensity

Module 'particles_dust_brdeplete.f90'

xpm	x_{part}
xp2m	x^2_{part}
vrelpabsm	Absolutevalueofmeanrelativevelocity
vpxm	u_{part}
vpx2m	u^2_{part}
ekinp	$E_{kin,part}$
vpxmax	$MAX(u_{part})$
vpxmin	$MIN(u_{part})$
npm	meanparticlenumberdensity

Module 'particles_lagrangian.f90'

xpm	x_{part}
xp2m	x^2_{part}
vrelpabsm	Absolutevalueofmeanrelativevelocity
vpxm	u_{part}
vpx2m	u^2_{part}
ekinp	$E_{kin,part}$
vpxmax	$MAX(u_{part})$
vpxmin	$MIN(u_{part})$
npm	meanparticlenumberdensity

Module 'particles_mass_swarm.f90'

mpm	$\overline{m_p}$
mpmin	$\min_j m_{p,j}$
mpmax	$\max_j m_{p,j}$

Module 'particles_surfspec.f90'

dtpchem	$dt_{particle,chemistry}$

Module 'polymer.f90'

polytrm	$\langle Tr[C_{ij}]\rangle$
frmax	$\max(f(r))$

Module ‘r75612.f90’

h22rms	h_{22}^{rms}
h33rms	h_{33}^{rms}
h23rms	h_{23}^{rms}
g11pt	$g_{11}(x_1, y_1, z_1, t)$
g22pt	$g_{22}(x_1, y_1, z_1, t)$
g33pt	$g_{33}(x_1, y_1, z_1, t)$
g12pt	$g_{12}(x_1, y_1, z_1, t)$
g23pt	$g_{23}(x_1, y_1, z_1, t)$
g31pt	$g_{31}(x_1, y_1, z_1, t)$
hhTpt	$h_T(x_1, y_1, z_1, t)$
hhXpt	$h_X(x_1, y_1, z_1, t)$
ggTpt	$\dot{h}_T(x_1, y_1, z_1, t)$
ggXpt	$\dot{h}_X(x_1, y_1, z_1, t)$
hhTp2	$h_T(x_1, y_1, z_1, t)$
hhXp2	$h_X(x_1, y_1, z_1, t)$
ggTp2	$\dot{h}_T(x_1, y_1, z_1, t)$
ggXp2	$\dot{h}_X(x_1, y_1, z_1, t)$
hrms	$\langle h_T^2 + h_X^2 \rangle^{1/2}$
gg2m	$\langle g_T^2 + g_X^2 \rangle$
hhT2m	$\langle h_T^2 \rangle$
hhX2m	$\langle h_X^2 \rangle$
hhTXm	$\langle h_T h_X \rangle$
ggT2m	$\langle g_T^2 \rangle$
ggX2m	$\langle g_X^2 \rangle$
ggTXm	$\langle g_T g_X \rangle$
ggTm	$\langle g_T \rangle$
ggXm	$\langle g_X \rangle$

Module ‘r75759.f90’

h22rms	h_{22}^{rms}
h33rms	h_{33}^{rms}
h23rms	h_{23}^{rms}
g11pt	$g_{11}(x_1, y_1, z_1, t)$
g22pt	$g_{22}(x_1, y_1, z_1, t)$
g33pt	$g_{33}(x_1, y_1, z_1, t)$
g12pt	$g_{12}(x_1, y_1, z_1, t)$
g23pt	$g_{23}(x_1, y_1, z_1, t)$
g31pt	$g_{31}(x_1, y_1, z_1, t)$

hhTpt	$h_T(x_1, y_1, z_1, t)$
hhXpt	$h_X(x_1, y_1, z_1, t)$
ggTpt	$\dot{h}_T(x_1, y_1, z_1, t)$
ggXpt	$\dot{h}_X(x_1, y_1, z_1, t)$
hhTp2	$h_T(x_1, y_1, z_1, t)$
hhXp2	$h_X(x_1, y_1, z_1, t)$
ggTp2	$\dot{h}_T(x_1, y_1, z_1, t)$
ggXp2	$\dot{h}_X(x_1, y_1, z_1, t)$
hrms	$\langle h_T^2 + h_X^2 \rangle^{1/2}$
gg2m	$\langle g_T^2 + g_X^2 \rangle$
hhT2m	$\langle h_T^2 \rangle$
hhX2m	$\langle h_X^2 \rangle$
hhTXm	$\langle h_T h_X \rangle$
ggT2m	$\langle g_T^2 \rangle$
ggX2m	$\langle g_X^2 \rangle$
ggTXm	$\langle g_T g_X \rangle$
ggTm	$\langle g_T \rangle$
ggXm	$\langle g_X \rangle$
Module ‘shear.f90’	
dtshear	advec_shear/cdt
deltay	deltay
Module ‘shock.f90’	
shockmax	Max shock number
Module ‘shock_highorder.f90’	
gshockmax	max $\lvert\nabla \nu_{shock}\rvert$
Module ‘solar_corona.f90’	
dtvel	Velocity driver time step
dtnewt	Radiative cooling time step
dtradloss	Radiative losses time step
dtchi2	$\delta t/[c_{\delta t,\mathrm{v}}\,\delta x^2/\chi_{\max}]$ (time step relative to time step based on heat conductivity; see § ??)
dtspitzer	Spitzer heat conduction time step
mag_flux	Total vertical magnetic flux at
Module ‘solid_cells_CGEO.f90’	
Module ‘solid_cells_reactive.f90’	

TTmax	$\max(T)$
gTmax	$\max(\|\nabla T\|)$
TTmin	$\min(T)$
TTm	$\langle T\rangle$
TTzmask	$\langle T\rangle$ for the temp_zaver_range
TT2m	$\langle T^2\rangle$
TugTm	$\langle T\boldsymbol{u}\cdot\nabla T\rangle$
Trms	$\sqrt{\langle T^2\rangle}$
uxTm	$\langle u_xT\rangle$
uyTm	$\langle u_yT\rangle$
uzTm	$\langle u_zT\rangle$
gT2m	$\langle(\nabla T)^2\rangle$
guxgTm	$\langle\nabla u_x\cdot\nabla T\rangle$
guygTm	$\langle\nabla u_y\cdot\nabla T\rangle$
guzgTm	$\langle\nabla u_z\cdot\nabla T\rangle$
Tugux_uxugTm	$\langle T\boldsymbol{u}\cdot\nabla u_x+u_x\boldsymbol{u}\cdot\nabla T\rangle=\langle\boldsymbol{u}\cdot\nabla(u_xT)\rangle$
Tuguy_uyugTm	$\langle T\boldsymbol{u}\cdot\nabla u_y+u_y\boldsymbol{u}\cdot\nabla T\rangle=\langle\boldsymbol{u}\cdot\nabla(u_yT)\rangle$
Tuguz_uzugTm	$\langle T\boldsymbol{u}\cdot\nabla u_z+u_z\boldsymbol{u}\cdot\nabla T\rangle=\langle\boldsymbol{u}\cdot\nabla(u_zT)\rangle$
Tdxpm	$\langle T\,dp/dx\rangle$
Tdypm	$\langle T\,dp/dy\rangle$
Tdzpm	$\langle T\,dp/dz\rangle$
fradtop	$< -K\frac{dT}{dz} >_{\rm top}$ (top radiative flux)
fradbot	$< -K\frac{dT}{dz} >_{\rm bot}$ (bottom radiative flux)
yHmax	DOCUMENT ME
yHmin	DOCUMENT ME
yHm	DOCUMENT ME
ethm	$\langle e_{\rm th}\rangle=\langle c_v\rho T\rangle$ (mean thermal energy)
eem	$\langle e\rangle=\langle c_vT\rangle$ (mean internal energy)
ethtot	$\int_V\varrho e\,dV$ (total thermal energy)
ssm	$\overline{S}$
thcool	$\tau_{\rm cool}$
ppm	$\overline{P}$
csm	$\overline{c}_{\rm s}$
csmax	$\max(c_{\rm s})$
dtc	$\delta t/[c_{\delta t}\,\delta_x/\max c_{\rm s}]$ (time step relative to acoustic time step; see § ??)

dtchi	$\delta t/[c_{\delta t,\mathrm{v}}\,\delta x^2/\chi_{\max}]$ (time step relative to time step based on heat conductivity; see § ??)
Emzmask	$\langle n^2 \exp -(\log T - \log T_0)^2/(\delta \log T)^2\rangle$ the emiss_zaver_range
	Module 'temperature_ionization.f90'
TTmax	$\max(T)$
TTmin	$\min(T)$
TTm	$\langle T\rangle$
ethm	$\langle e_{\mathrm{th}}\rangle = \langle c_v \rho T\rangle$ (mean thermal energy)
eem	$\langle e\rangle$ (mean internal energy)
ppm	$\langle p\rangle$
	Module 'testfield_axisym.f90'
alpPERP	$\alpha_\perp$
alpPARA	$\alpha_\perp$
gam	γ
betPERP	$\beta_\perp$
betPARA	$\beta_\perp$
del	δ
kapPERP	$\kappa_\perp$
kapPARA	$\kappa_\perp$
mu	μ
alpPERPz	$\alpha_\perp(z)$
alpPARAz	$\alpha_\perp(z)$
gamz	$\gamma(z)$
betPERPz	$\beta_\perp(z)$
betPARAz	$\beta_\perp(z)$
delz	$\delta(z)$
kapPERPz	$\kappa_\perp(z)$
kapPARAz	$\kappa_\perp(z)$
muz	$\mu(z)$
bx1pt	b_x^1
bx2pt	b_x^2
bx3pt	b_x^3
b1rms	$\langle b_1^2\rangle^{1/2}$
b2rms	$\langle b_2^2\rangle^{1/2}$
b3rms	$\langle b_3^2\rangle^{1/2}$
	Module 'testfield_axisym2.f90'
alpPERP	$\alpha_\perp$

alpPARA	$\alpha_\perp$
gam	γ
betPERP	$\beta_\perp$
betPARA	$\beta_\perp$
del	δ
kapPERP	$\kappa_\perp$
kapPARA	$\kappa_\perp$
mu	μ
bx1pt	b_x^1
bx2pt	b_x^2
bx3pt	b_x^3
b1rms	$\langle b_1^2\rangle^{1/2}$
b2rms	$\langle b_2^2\rangle^{1/2}$
b3rms	$\langle b_3^2\rangle^{1/2}$
Module 'testfield_axisym4.f90'	
alpPERP	$\alpha_\perp$
alpPARA	$\alpha_\perp$
gam	γ
betPERP	$\beta_\perp$
betPERP2	$\beta_\perp^{(2)}$
betPARA	$\beta_\perp$
del	δ
del2	$\delta^{(2)}$
kapPERP	$\kappa_\perp$
kapPERP2	$\kappa_\perp^{(2)}$
kapPARA	$\kappa_\perp$
mu	μ
mu2	$\mu^{(2)}$
alpPERPz	$\alpha_\perp(z)$
alpPARAz	$\alpha_\perp(z)$
gamz	$\gamma(z)$
betPERPz	$\beta_\perp(z)$
betPARAz	$\beta_\perp(z)$
delz	$\delta(z)$
kapPERPz	$\kappa_\perp(z)$
kapPARAz	$\kappa_\perp(z)$
muz	$\mu(z)$
bx1pt	b_x^1

bx2pt	b_x^2
bx3pt	b_x^3
b1rms	$\langle b_1^2 \rangle^{1/2}$
b2rms	$\langle b_2^2 \rangle^{1/2}$
b3rms	$\langle b_3^2 \rangle^{1/2}$
Module 'testfield_compress_z.f90'	
alp11	α_{11}
alp21	α_{21}
alp31	α_{31}
alp12	α_{12}
alp22	α_{22}
alp32	α_{32}
eta11	$\eta_{11}k$
eta21	$\eta_{21}k$
eta12	$\eta_{12}k$
eta22	$\eta_{22}k$
alpK	α^K
alpM	α^M
alpMK	α^{MK}
phi11	ϕ_{11}
phi21	ϕ_{21}
phi12	ϕ_{12}
phi22	ϕ_{22}
phi32	ϕ_{32}
psi11	$\psi_{11}k$
psi21	$\psi_{21}k$
psi12	$\psi_{12}k$
psi22	$\psi_{22}k$
phiK	ϕ^K
phiM	ϕ^M
phiMK	ϕ^{MK}
alp11cc	$\alpha_{11}\cos^2 kz$
alp21sc	$\alpha_{21}\sin kz\cos kz$
alp12cs	$\alpha_{12}\cos kz\sin kz$
alp22ss	$\alpha_{22}\sin^2 kz$
eta11cc	$\eta_{11}\cos^2 kz$
eta21sc	$\eta_{21}\sin kz\cos kz$
eta12cs	$\eta_{12}\cos kz\sin kz$

eta22ss	$\eta_{22}\sin^2 kz$
s2kzDFm	$\langle\sin 2kz\nabla\cdot F\rangle$
M11	$\mathcal{M}_{11}$
M22	$\mathcal{M}_{22}$
M33	$\mathcal{M}_{33}$
M11cc	$\mathcal{M}_{11}\cos^2 kz$
M11ss	$\mathcal{M}_{11}\sin^2 kz$
M22cc	$\mathcal{M}_{22}\cos^2 kz$
M22ss	$\mathcal{M}_{22}\sin^2 kz$
M12cs	$\mathcal{M}_{12}\cos kz\sin kz$
bx11pt	b_x^{11}
bx21pt	b_x^{21}
bx12pt	b_x^{12}
bx22pt	b_x^{22}
bx0pt	b_x^{0}
by11pt	b_y^{11}
by21pt	b_y^{21}
by12pt	b_y^{12}
by22pt	b_y^{22}
by0pt	b_y^{0}
u11rms	$\langle u_{11}^2\rangle^{1/2}$
u21rms	$\langle u_{21}^2\rangle^{1/2}$
u12rms	$\langle u_{12}^2\rangle^{1/2}$
u22rms	$\langle u_{22}^2\rangle^{1/2}$
j11rms	$\langle j_{11}^2\rangle^{1/2}$
b11rms	$\langle b_{11}^2\rangle^{1/2}$
b21rms	$\langle b_{21}^2\rangle^{1/2}$
b12rms	$\langle b_{12}^2\rangle^{1/2}$
b22rms	$\langle b_{22}^2\rangle^{1/2}$
ux0m	$\langle u_{0_x}\rangle$
uy0m	$\left\langle u_{0_y}\right\rangle$
ux11m	$\langle u_{11_x}\rangle$
uy11m	$\left\langle u_{11_y}\right\rangle$
u0rms	$\langle u_0^2\rangle^{1/2}$
b0rms	$\langle b_0^2\rangle^{1/2}$
jb0m	$\langle jb_0\rangle$
E11rms	$\langle\mathcal{E}_{11}^2\rangle^{1/2}$
E21rms	$\langle\mathcal{E}_{21}^2\rangle^{1/2}$
E12rms	$\langle\mathcal{E}_{12}^2\rangle^{1/2}$

E22rms	$\langle \mathcal{E}_{22}^2 \rangle^{1/2}$
E0rms	$\langle \mathcal{E}_{0}^2 \rangle^{1/2}$
Ex11pt	$\mathcal{E}_x^{11}$
Ex21pt	$\mathcal{E}_x^{21}$
Ex12pt	$\mathcal{E}_x^{12}$
Ex22pt	$\mathcal{E}_x^{22}$
Ex0pt	$\mathcal{E}_x^{0}$
Ey11pt	$\mathcal{E}_y^{11}$
Ey21pt	$\mathcal{E}_y^{21}$
Ey12pt	$\mathcal{E}_y^{12}$
Ey22pt	$\mathcal{E}_y^{22}$
Ey0pt	$\mathcal{E}_y^{0}$
bamp	bamp
E111z	$\mathcal{E}_1^{11}$
E211z	$\mathcal{E}_2^{11}$
E311z	$\mathcal{E}_3^{11}$
E121z	$\mathcal{E}_1^{21}$
E221z	$\mathcal{E}_2^{21}$
E321z	$\mathcal{E}_3^{21}$
E112z	$\mathcal{E}_1^{12}$
E212z	$\mathcal{E}_2^{12}$
E312z	$\mathcal{E}_3^{12}$
E122z	$\mathcal{E}_1^{22}$
E222z	$\mathcal{E}_2^{22}$
E322z	$\mathcal{E}_3^{22}$
E10z	$\mathcal{E}_1^{0}$
E20z	$\mathcal{E}_2^{0}$
E30z	$\mathcal{E}_3^{0}$
EBpq	$\mathcal{E} \cdot \boldsymbol{B}^{pq}$
E0Um	$\mathcal{E}^0 \cdot \boldsymbol{U}$
E0Wm	$\mathcal{E}^0 \cdot \boldsymbol{W}$
bx0mz	$\langle b_x \rangle_{xy}$
by0mz	$\langle b_y \rangle_{xy}$
bz0mz	$\langle b_z \rangle_{xy}$
M11z	$\langle \mathcal{M}_{11} \rangle_{xy}$
M22z	$\langle \mathcal{M}_{22} \rangle_{xy}$
M33z	$\langle \mathcal{M}_{33} \rangle_{xy}$

Module ‘testfield_meri.f90’

E11xy	E_{11xy}
E12xy	E_{12xy}
E13xy	E_{13xy}
E21xy	E_{21xy}
E22xy	E_{22xy}
E23xy	E_{23xy}
E31xy	E_{31xy}
E32xy	E_{32xy}
E33xy	E_{33xy}
E41xy	E_{41xy}
E42xy	E_{42xy}
E43xy	E_{43xy}
E51xy	E_{51xy}
E52xy	E_{52xy}
E53xy	E_{53xy}
E61xy	E_{61xy}
E62xy	E_{62xy}
E63xy	E_{63xy}
E71xy	E_{71xy}
E72xy	E_{72xy}
E73xy	E_{73xy}
E81xy	E_{81}
E82xy	E_{82}
E83xy	E_{83}
E91xy	E_{91}
E92xy	E_{92}
E93xy	E_{93}
a11xy	α_{11}
a12xy	α_{12}
a13xy	α_{13}
a21xy	α_{21}
a22xy	α_{22}
a23xy	α_{23}
a31xy	α_{31}
a32xy	α_{32}
a33xy	α_{33}
b111xy	111
b121xy	121
b131xy	131

b211xy	211
b221xy	221
b231xy	231
b311xy	311
b321xy	321
b331xy	331
b112xy	112
b122xy	122
b132xy	132
b212xy	212
b222xy	222
b232xy	232
b312xy	312
b322xy	322
b332xy	332

Module ‘testfield_nonlin_z.f90’

alp11	α_{11}
alp21	α_{21}
alp31	α_{31}
alp12	α_{12}
alp22	α_{22}
alp32	α_{32}
eta11	$\eta_{11}k$
eta21	$\eta_{21}k$
eta12	$\eta_{12}k$
eta22	$\eta_{22}k$
alpK	α^{K}
alpM	α^{M}
alpMK	α^{MK}
phi11	ϕ_{11}
phi21	ϕ_{21}
phi12	ϕ_{12}
phi22	ϕ_{22}
phi32	ϕ_{32}
psi11	$\psi_{11}k$
psi21	$\psi_{21}k$
psi12	$\psi_{12}k$
psi22	$\psi_{22}k$

phiK	ϕ^K
phiM	ϕ^M
phiMK	ϕ^{MK}
alp11cc	$\alpha_{11}\cos^2 kz$
alp21sc	$\alpha_{21}\sin kz\cos kz$
alp12cs	$\alpha_{12}\cos kz\sin kz$
alp22ss	$\alpha_{22}\sin^2 kz$
eta11cc	$\eta_{11}\cos^2 kz$
eta21sc	$\eta_{21}\sin kz\cos kz$
eta12cs	$\eta_{12}\cos kz\sin kz$
eta22ss	$\eta_{22}\sin^2 kz$
s2kzDFm	$\langle\sin 2kz\nabla\cdot F\rangle$
M11	$\mathcal{M}_{11}$
M22	$\mathcal{M}_{22}$
M33	$\mathcal{M}_{33}$
M11cc	$\mathcal{M}_{11}\cos^2 kz$
M11ss	$\mathcal{M}_{11}\sin^2 kz$
M22cc	$\mathcal{M}_{22}\cos^2 kz$
M22ss	$\mathcal{M}_{22}\sin^2 kz$
M12cs	$\mathcal{M}_{12}\cos kz\sin kz$
bx11pt	b_x^{11}
bx21pt	b_x^{21}
bx12pt	b_x^{12}
bx22pt	b_x^{22}
bx0pt	b_x^{0}
by11pt	b_y^{11}
by21pt	b_y^{21}
by12pt	b_y^{12}
by22pt	b_y^{22}
by0pt	b_y^{0}
u11rms	$\langle u_{11}^2\rangle^{1/2}$
u21rms	$\langle u_{21}^2\rangle^{1/2}$
u12rms	$\langle u_{12}^2\rangle^{1/2}$
u22rms	$\langle u_{22}^2\rangle^{1/2}$
j11rms	$\langle j_{11}^2\rangle^{1/2}$
b11rms	$\langle b_{11}^2\rangle^{1/2}$
b21rms	$\langle b_{21}^2\rangle^{1/2}$
b12rms	$\langle b_{12}^2\rangle^{1/2}$
b22rms	$\langle b_{22}^2\rangle^{1/2}$

ux0m	$\langle u_{0_x}\rangle$
uy0m	$\langle u_{0_y}\rangle$
ux11m	$\langle u_{11_x}\rangle$
uy11m	$\langle u_{11_y}\rangle$
u0rms	$\langle u_0^2\rangle^{1/2}$
b0rms	$\langle b_0^2\rangle^{1/2}$
jb0m	$\langle jb_0\rangle$
E11rms	$\langle \mathcal{E}_{11}^2\rangle^{1/2}$
E21rms	$\langle \mathcal{E}_{21}^2\rangle^{1/2}$
E12rms	$\langle \mathcal{E}_{12}^2\rangle^{1/2}$
E22rms	$\langle \mathcal{E}_{22}^2\rangle^{1/2}$
E0rms	$\langle \mathcal{E}_{0}^2\rangle^{1/2}$
Ex11pt	$\mathcal{E}_x^{11}$
Ex21pt	$\mathcal{E}_x^{21}$
Ex12pt	$\mathcal{E}_x^{12}$
Ex22pt	$\mathcal{E}_x^{22}$
Ex0pt	$\mathcal{E}_x^{0}$
Ey11pt	$\mathcal{E}_y^{11}$
Ey21pt	$\mathcal{E}_y^{21}$
Ey12pt	$\mathcal{E}_y^{12}$
Ey22pt	$\mathcal{E}_y^{22}$
Ey0pt	$\mathcal{E}_y^{0}$
bamp	bamp
E111z	$\mathcal{E}_1^{11}$
E211z	$\mathcal{E}_2^{11}$
E311z	$\mathcal{E}_3^{11}$
E121z	$\mathcal{E}_1^{21}$
E221z	$\mathcal{E}_2^{21}$
E321z	$\mathcal{E}_3^{21}$
E112z	$\mathcal{E}_1^{12}$
E212z	$\mathcal{E}_2^{12}$
E312z	$\mathcal{E}_3^{12}$
E122z	$\mathcal{E}_1^{22}$
E222z	$\mathcal{E}_2^{22}$
E322z	$\mathcal{E}_3^{22}$
E10z	$\mathcal{E}_1^{0}$
E20z	$\mathcal{E}_2^{0}$
E30z	$\mathcal{E}_3^{0}$
EBpq	$\mathcal{E}\cdot\boldsymbol{B}^{pq}$

E0Um	$\boldsymbol{\mathcal{E}}^0 \cdot \boldsymbol{U}$
E0Wm	$\boldsymbol{\mathcal{E}}^0 \cdot \boldsymbol{W}$
bx0mz	$\langle b_x \rangle_{xy}$
by0mz	$\langle b_y \rangle_{xy}$
bz0mz	$\langle b_z \rangle_{xy}$
M11z	$\langle \mathcal{M}_{11} \rangle_{xy}$
M22z	$\langle \mathcal{M}_{22} \rangle_{xy}$
M33z	$\langle \mathcal{M}_{33} \rangle_{xy}$

Module 'testfield_x.f90'

alp11	α_{11}
alp21	α_{21}
alp31	α_{31}
alp12	α_{12}
alp22	α_{22}
alp32	α_{32}
eta11	$\eta_{11}k$
eta21	$\eta_{21}k$
eta12	$\eta_{12}k$
eta22	$\eta_{22}k$
alp11cc	$\alpha_{11}\cos^2 kx$
alp21sc	$\alpha_{21}\sin kx \cos kx$
alp12cs	$\alpha_{12}\cos kx \sin kx$
alp22ss	$\alpha_{22}\sin^2 kx$
eta11cc	$\eta_{11}\cos^2 kx$
eta21sc	$\eta_{21}\sin kx \cos kx$
eta12cs	$\eta_{12}\cos kx \sin kx$
eta22ss	$\eta_{22}\sin^2 kx$
alp11_x	$\alpha_{11}x$
alp21_x	$\alpha_{21}x$
alp12_x	$\alpha_{12}x$
alp22_x	$\alpha_{22}x$
eta11_x	$\eta_{11}kx$
eta21_x	$\eta_{21}kx$
eta12_x	$\eta_{12}kx$
eta22_x	$\eta_{22}kx$
alp11_x2	$\alpha_{11}x^2$
alp21_x2	$\alpha_{21}x^2$
alp12_x2	$\alpha_{12}x^2$

alp22_x2	$\alpha_{22}x^2$
eta11_x2	$\eta_{11}kx^2$
eta21_x2	$\eta_{21}kx^2$
eta12_x2	$\eta_{12}kx^2$
eta22_x2	$\eta_{22}kx^2$
b11rms	$\langle b_{11}^2\rangle^{1/2}$
b21rms	$\langle b_{21}^2\rangle^{1/2}$
b12rms	$\langle b_{12}^2\rangle^{1/2}$
b22rms	$\langle b_{22}^2\rangle^{1/2}$
b0rms	$\langle b_{0}^2\rangle^{1/2}$
E11rms	$\langle \mathcal{E}_{11}^2\rangle^{1/2}$
E21rms	$\langle \mathcal{E}_{21}^2\rangle^{1/2}$
E12rms	$\langle \mathcal{E}_{12}^2\rangle^{1/2}$
E22rms	$\langle \mathcal{E}_{22}^2\rangle^{1/2}$
E0rms	$\langle \mathcal{E}_{0}^2\rangle^{1/2}$
E111z	$\mathcal{E}_1^{11}$
E211z	$\mathcal{E}_2^{11}$
E311z	$\mathcal{E}_3^{11}$
E121z	$\mathcal{E}_1^{21}$
E221z	$\mathcal{E}_2^{21}$
E321z	$\mathcal{E}_3^{21}$
E112z	$\mathcal{E}_1^{12}$
E212z	$\mathcal{E}_2^{12}$
E312z	$\mathcal{E}_3^{12}$
E122z	$\mathcal{E}_1^{22}$
E222z	$\mathcal{E}_2^{22}$
E322z	$\mathcal{E}_3^{22}$
E10z	$\mathcal{E}_1^{0}$
E20z	$\mathcal{E}_2^{0}$
E30z	$\mathcal{E}_3^{0}$
EBpq	$\mathcal{E}\cdot\boldsymbol{B}^{pq}$
bx0mz	$\langle b_x\rangle_{xy}$
by0mz	$\langle b_y\rangle_{xy}$
bz0mz	$\langle b_z\rangle_{xy}$
alp11x	$\alpha_{11}(x,t)$
alp21x	$\alpha_{21}(x,t)$
alp12x	$\alpha_{12}(x,t)$
alp22x	$\alpha_{22}(x,t)$
eta11x	$\eta_{11}(x,t)$

eta21x	$\eta_{21}(x,t)$
eta12x	$\eta_{12}(x,t)$
eta22x	$\eta_{22}(x,t)$

Module ‘testfield_xz.f90’

E111z	$\mathcal{E}_1^{11}$
E211z	$\mathcal{E}_2^{11}$
E311z	$\mathcal{E}_3^{11}$
E121z	$\mathcal{E}_1^{21}$
E221z	$\mathcal{E}_2^{21}$
E321z	$\mathcal{E}_3^{21}$
alp11	α_{11}
alp21	α_{21}
eta11	$\eta_{113}k$
eta21	$\eta_{213}k$
b11rms	$\langle b_{11}^2 \rangle$
b21rms	$\langle b_{21}^2 \rangle$

Module ‘testfield_z.f90’

alp11	α_{11}
alp21	α_{21}
alp31	α_{31}
alp12	α_{12}
alp22	α_{22}
alp32	α_{32}
alp13	α_{13}
alp23	α_{23}
eta11	$\eta_{113}k$ or $\eta_{11}k$ if leta_rank2=T
eta21	$\eta_{213}k$ or $\eta_{21}k$ if leta_rank2=T
eta31	$\eta_{313}k$
eta12	$\eta_{123}k$ or $\eta_{12}k$ if leta_rank2=T
eta22	$\eta_{223}k$ or $\eta_{22}k$ if leta_rank2=T
eta32	$\eta_{323}k$
alp11cc	$\alpha_{11}\cos^2 kz$
alp21sc	$\alpha_{21}\sin kz \cos kz$
alp12cs	$\alpha_{12}\cos kz \sin kz$
alp22ss	$\alpha_{22}\sin^2 kz$
eta11cc	$\eta_{11}\cos^2 kz$
eta21sc	$\eta_{21}\sin kz \cos kz$

eta12cs	$\eta_{12}\cos kz\sin kz$
eta22ss	$\eta_{22}\sin^2 kz$
s2kzDFm	$\langle\sin 2kz\nabla\cdot F\rangle$
M11	$\mathcal{M}_{11}$
M22	$\mathcal{M}_{22}$
M33	$\mathcal{M}_{33}$
M11cc	$\mathcal{M}_{11}\cos^2 kz$
M11ss	$\mathcal{M}_{11}\sin^2 kz$
M22cc	$\mathcal{M}_{22}\cos^2 kz$
M22ss	$\mathcal{M}_{22}\sin^2 kz$
M12cs	$\mathcal{M}_{12}\cos kz\sin kz$
bx11pt	b_x^{11}
bx21pt	b_x^{21}
bx12pt	b_x^{12}
bx22pt	b_x^{22}
bx0pt	b_x^{0}
by11pt	b_y^{11}
by21pt	b_y^{21}
by12pt	b_y^{12}
by22pt	b_y^{22}
by0pt	b_y^{0}
b11rms	$\langle b_{11}^2\rangle^{1/2}$
b21rms	$\langle b_{21}^2\rangle^{1/2}$
b12rms	$\langle b_{12}^2\rangle^{1/2}$
b22rms	$\langle b_{22}^2\rangle^{1/2}$
b0rms	$\langle b_{0}^2\rangle^{1/2}$
jb0m	$\langle jb_0\rangle$
E11rms	$\langle \mathcal{E}_{11}^2\rangle^{1/2}$
E21rms	$\langle \mathcal{E}_{21}^2\rangle^{1/2}$
E12rms	$\langle \mathcal{E}_{12}^2\rangle^{1/2}$
E22rms	$\langle \mathcal{E}_{22}^2\rangle^{1/2}$
E0rms	$\langle \mathcal{E}_{0}^2\rangle^{1/2}$
Ex11pt	$\mathcal{E}_x^{11}$
Ex21pt	$\mathcal{E}_x^{21}$
Ex12pt	$\mathcal{E}_x^{12}$
Ex22pt	$\mathcal{E}_x^{22}$
Ex0pt	$\mathcal{E}_x^{0}$
Ey11pt	$\mathcal{E}_y^{11}$
Ey21pt	$\mathcal{E}_y^{21}$

Ey12pt	$\mathcal{E}_y^{12}$
Ey22pt	$\mathcal{E}_y^{22}$
Ey0pt	$\mathcal{E}_y^{0}$
bamp	bamp
alp11z	$\alpha_{11}(z,t)$
alp21z	$\alpha_{21}(z,t)$
alp12z	$\alpha_{12}(z,t)$
alp22z	$\alpha_{22}(z,t)$
alp13z	$\alpha_{13}(z,t)$
alp23z	$\alpha_{23}(z,t)$
eta11z	$\eta_{11}(z,t)$
eta21z	$\eta_{21}(z,t)$
eta12z	$\eta_{12}(z,t)$
eta22z	$\eta_{22}(z,t)$
uzjx1z	$u_z j_x^{11}$
uzjy1z	$u_z j_y^{11}$
uzjz1z	$u_z j_z^{11}$
uzjx2z	$u_z j_x^{21}$
uzjy2z	$u_z j_y^{21}$
uzjz2z	$u_z j_z^{21}$
uzjx3z	$u_z j_x^{12}$
uzjy3z	$u_z j_y^{12}$
uzjz3z	$u_z j_z^{12}$
uzjx4z	$u_z j_x^{22}$
uzjy4z	$u_z j_y^{22}$
uzjz4z	$u_z j_z^{22}$
E111z	$\mathcal{E}_1^{11}$
E211z	$\mathcal{E}_2^{11}$
E311z	$\mathcal{E}_3^{11}$
E121z	$\mathcal{E}_1^{21}$
E221z	$\mathcal{E}_2^{21}$
E321z	$\mathcal{E}_3^{21}$
E112z	$\mathcal{E}_1^{12}$
E212z	$\mathcal{E}_2^{12}$
E312z	$\mathcal{E}_3^{12}$
E122z	$\mathcal{E}_1^{22}$
E222z	$\mathcal{E}_2^{22}$
E322z	$\mathcal{E}_3^{22}$
E10z	$\mathcal{E}_1^{0}$

E20z	$\mathcal{E}_2^0$
E30z	$\mathcal{E}_3^0$
EBpq	$\mathcal{E} \cdot \boldsymbol{B}^{pq}$
E0Um	$\mathcal{E}^0 \cdot \boldsymbol{U}$
E0Wm	$\mathcal{E}^0 \cdot \boldsymbol{W}$
bx0mz	$\langle b_x \rangle_{xy}$
by0mz	$\langle b_y \rangle_{xy}$
bz0mz	$\langle b_z \rangle_{xy}$
M11z	$\langle \mathcal{M}_{11} \rangle_{xy}$
M22z	$\langle \mathcal{M}_{22} \rangle_{xy}$
M33z	$\langle \mathcal{M}_{33} \rangle_{xy}$
Module 'testflow_z.f90'	
gal	GAL-coefficients, couple $\overline{F}$ and $\overline{U}$
aklam	AKA-λ-tensor, couples $\overline{F}$ and $\overline{W} = \nabla \times \overline{U}$
gamma	γ-vector, couples $\overline{F}$ and $\nabla \cdot \overline{U}$
nu	ν-tensor, couples $\overline{F}$ and $\partial^2 \overline{U} / \partial z^2$
zeta	ζ-vector, couples $\overline{F}$ and $\overline{G}_z = \nabla_z \overline{H}$
xi	ξ-vector, couples $\overline{F}$ and $\partial^2 \overline{H} / \partial z^2$
aklamQ	$aklam^Q$-vector, couples $\overline{Q}$ and $\overline{W}$
gammaQ	γ^Q-scalar, couples $\overline{Q}$ and $\nabla \cdot \overline{U} = dU_z/dz$
nuQ	ν^Q-vector, couples $\overline{Q}$ and $\partial^2 \overline{U} / \partial z^2$
zetaQ	ζ^Q-scalar, couples $\overline{Q}$ and $\overline{G}_z$
xiQ	ξ^Q-scalar, couples $\overline{Q}$ and $\partial^2 \overline{H} / \partial z^2$
	$\alpha_{K,ij}$ γ_i ν_{ij} ζ_i ξ_i ν_i^Q $aklam_i^Q$ $\mathcal{F}_i^{pq}$ $\mathcal{Q}^{pq}$ $\langle u^{pq2} \rangle$ $\langle h^{pq2} \rangle$
ux0mz	$\langle u_x \rangle_{xy}$
uy0mz	$\langle u_y \rangle_{xy}$
uz0mz	$\langle u_z \rangle_{xy}$
Module 'testperturb.f90'	
alp11	α_{11}
alp21	α_{21}
alp31	α_{31}
alp12	α_{12}
alp22	α_{22}
alp32	α_{32}
eta11	$\eta_{113}k$
eta21	$\eta_{213}k$
eta31	$\eta_{313}k$

eta12	$\eta_{123}k$
eta22	$\eta_{223}k$
eta32	$\eta_{323}k$

Module 'testscalar.f90'

gam11	$\gamma_1^{(1)}$
gam12	$\gamma_2^{(1)}$
gam13	$\gamma_3^{(1)}$
gam21	$\gamma_1^{(2)}$
gam22	$\gamma_2^{(2)}$
gam23	$\gamma_3^{(2)}$
gam31	$\gamma_1^{(3)}$
gam32	$\gamma_2^{(3)}$
gam33	$\gamma_3^{(3)}$
kap11	κ_{11}
kap21	κ_{21}
kap31	κ_{31}
kap12	κ_{12}
kap22	κ_{22}
kap32	κ_{32}
kap13	κ_{13}
kap23	κ_{23}
kap33	κ_{33}
gam11z	$\gamma_1^{(1)}(z,t)$
gam12z	$\gamma_2^{(1)}(z,t)$
gam13z	$\gamma_3^{(1)}(z,t)$
gam21z	$\gamma_1^{(2)}(z,t)$
gam22z	$\gamma_2^{(2)}(z,t)$
gam23z	$\gamma_3^{(2)}(z,t)$
gam31z	$\gamma_1^{(3)}(z,t)$
gam32z	$\gamma_2^{(3)}(z,t)$
gam33z	$\gamma_3^{(3)}(z,t)$
kap11z	$\kappa_{11}(z,t)$
kap21z	$\kappa_{21}(z,t)$
kap31z	$\kappa_{31}(z,t)$
kap12z	$\kappa_{12}(z,t)$
kap22z	$\kappa_{22}(z,t)$
kap32z	$\kappa_{32}(z,t)$
kap13z	$\kappa_{13}(z,t)$

kap23z	$\kappa_{23}(z,t)$
kap33z	$\kappa_{33}(z,t)$
mgam33	$\tilde{\gamma}_{33}$
mkap33	$\tilde{\kappa}_{33}$
ngam33	$\hat{\gamma}_{33}$
nkap33	$\hat{\kappa}_{33}$
c1rms	$\langle c_1^2\rangle^{1/2}$
c2rms	$\langle c_2^2\rangle^{1/2}$
c3rms	$\langle c_3^2\rangle^{1/2}$
c4rms	$\langle c_4^2\rangle^{1/2}$
c5rms	$\langle c_5^2\rangle^{1/2}$
c6rms	$\langle c_6^2\rangle^{1/2}$
c1pt	c^1
c2pt	c^2
c3pt	c^3
c4pt	c^4
c5pt	c^5
c6pt	c^6
F11z	$\mathcal{F}_1^1$
F21z	$\mathcal{F}_2^1$
F31z	$\mathcal{F}_3^1$
F12z	$\mathcal{F}_1^2$
F22z	$\mathcal{F}_2^2$
F32z	$\mathcal{F}_3^2$

Module ‘testscalar_axisym.f90’

muc1	$\mu^{(c1)}$
muc2	$\mu^{(c2)}$
gamc	$\gamma^{(c)}$
kapcPERP1	$\kappa_\perp^{(1)}$
kapcPERP2	$\kappa_\perp^{(2)}$
kapcPARA	$\kappa_\parallel$
mucz	$\mu^{(c)}(z,t)$
gamcz	$\gamma^{(c)}(z,t)$
kapcPERPz	$\kappa_\perp(z,t)$
kapcPARAz	$\kappa_\parallel(z,t)$
gam11	$\gamma_1^{(1)}$
gam12	$\gamma_2^{(1)}$
gam13	$\gamma_3^{(1)}$

gam21	$\gamma_1^{(2)}$
gam22	$\gamma_2^{(2)}$
gam23	$\gamma_3^{(2)}$
gam31	$\gamma_1^{(3)}$
gam32	$\gamma_2^{(3)}$
gam33	$\gamma_3^{(3)}$
kap11	κ_{11}
kap21	κ_{21}
kap31	κ_{31}
kap12	κ_{12}
kap22	κ_{22}
kap32	κ_{32}
kap13	κ_{13}
kap23	κ_{23}
kap33	κ_{33}
gam11z	$\gamma_1^{(1)}(z,t)$
gam12z	$\gamma_2^{(1)}(z,t)$
gam13z	$\gamma_3^{(1)}(z,t)$
gam21z	$\gamma_1^{(2)}(z,t)$
gam22z	$\gamma_2^{(2)}(z,t)$
gam23z	$\gamma_3^{(2)}(z,t)$
gam31z	$\gamma_1^{(3)}(z,t)$
gam32z	$\gamma_2^{(3)}(z,t)$
gam33z	$\gamma_3^{(3)}(z,t)$
gam3z	$\gamma^{(c)}(z,t)$
kap11z	$\kappa_{11}(z,t)$
kap21z	$\kappa_{21}(z,t)$
kap31z	$\kappa_{31}(z,t)$
kap12z	$\kappa_{12}(z,t)$
kap22z	$\kappa_{22}(z,t)$
kap32z	$\kappa_{32}(z,t)$
kap13z	$\kappa_{13}(z,t)$
kap23z	$\kappa_{23}(z,t)$
kap33z	$\kappa_{33}(z,t)$
mgam33	$\tilde{\gamma}_{33}$
mkap33	$\tilde{\kappa}_{33}$
ngam33	$\hat{\gamma}_{33}$
nkap33	$\hat{\kappa}_{33}$
c1rms	$\langle c_1^2 \rangle^{1/2}$

c2rms	$\langle c_2^2\rangle^{1/2}$
c3rms	$\langle c_3^2\rangle^{1/2}$
c4rms	$\langle c_4^2\rangle^{1/2}$
c5rms	$\langle c_5^2\rangle^{1/2}$
c6rms	$\langle c_6^2\rangle^{1/2}$
c1pt	c^1
c2pt	c^2
c3pt	c^3
c4pt	c^4
c5pt	c^5
c6pt	c^6
F11z	$\mathcal{F}_1^1$
F21z	$\mathcal{F}_2^1$
F31z	$\mathcal{F}_3^1$
F12z	$\mathcal{F}_1^2$
F22z	$\mathcal{F}_2^2$
F32z	$\mathcal{F}_3^2$

Module 'testscalar_simple.f90'

gam11	$\gamma_1^{(1)}$
gam12	$\gamma_2^{(1)}$
gam13	$\gamma_3^{(1)}$
gam21	$\gamma_1^{(2)}$
gam22	$\gamma_2^{(2)}$
gam23	$\gamma_3^{(2)}$
gam31	$\gamma_1^{(3)}$
gam32	$\gamma_2^{(3)}$
gam33	$\gamma_3^{(3)}$
kap11	κ_{11}
kap21	κ_{21}
kap31	κ_{31}
kap12	κ_{12}
kap22	κ_{22}
kap32	κ_{32}
kap13	κ_{13}
kap23	κ_{23}
kap33	κ_{33}
gam11z	$\gamma_1^{(1)}(z,t)$
gam12z	$\gamma_2^{(1)}(z,t)$

gam13z	$\gamma_3^{(1)}(z,t)$
gam21z	$\gamma_1^{(2)}(z,t)$
gam22z	$\gamma_2^{(2)}(z,t)$
gam23z	$\gamma_3^{(2)}(z,t)$
gam31z	$\gamma_1^{(3)}(z,t)$
gam32z	$\gamma_2^{(3)}(z,t)$
gam33z	$\gamma_3^{(3)}(z,t)$
kap11z	$\kappa_{11}(z,t)$
kap21z	$\kappa_{21}(z,t)$
kap31z	$\kappa_{31}(z,t)$
kap12z	$\kappa_{12}(z,t)$
kap22z	$\kappa_{22}(z,t)$
kap32z	$\kappa_{32}(z,t)$
kap13z	$\kappa_{13}(z,t)$
kap23z	$\kappa_{23}(z,t)$
kap33z	$\kappa_{33}(z,t)$
mgam33	$\tilde{\gamma}_{33}$
mkap33	$\tilde{\kappa}_{33}$
ngam33	$\hat{\gamma}_{33}$
nkap33	$\hat{\kappa}_{33}$
c1rms	$\langle c_1^2 \rangle^{1/2}$
c2rms	$\langle c_2^2 \rangle^{1/2}$
c3rms	$\langle c_3^2 \rangle^{1/2}$
c4rms	$\langle c_4^2 \rangle^{1/2}$
c5rms	$\langle c_5^2 \rangle^{1/2}$
c6rms	$\langle c_6^2 \rangle^{1/2}$
c1pt	c^1
c2pt	c^2
c3pt	c^3
c4pt	c^4
c5pt	c^5
c6pt	c^6
F11z	$\mathcal{F}_1^1$
F21z	$\mathcal{F}_2^1$
F31z	$\mathcal{F}_3^1$
F12z	$\mathcal{F}_1^2$
F22z	$\mathcal{F}_2^2$
F32z	$\mathcal{F}_3^2$

Module ‘thermal_energy.f90’

TTmax	$\max(T)$
TTmin	$\min(T)$
ppm	$\langle p\rangle$
TTm	$\langle T\rangle$
ethm	$\langle e_{\rm th}\rangle = \langle c_v\rho T\rangle$ (mean thermal energy)
ethtot	$\int_V e_{\rm th}\,dV$ (total thermal energy)
ethmin	$\min e_{\rm th}$
ethmax	$\max e_{\rm th}$
eem	$\langle e\rangle = \langle c_v T\rangle$ (mean internal energy)
etot	$\langle e_{\rm th} + \rho u^2/2\rangle$

Module ‘visc_smagorinsky.f90’

nu_LES	Mean value of Smagorinsky viscosity

Module ‘viscosity.f90’

nu_tdep	time-dependent viscosity
fviscm	Mean value of viscous acceleration
fviscmin	Min value of viscous acceleration
fviscmax	Max value of viscous acceleration
fviscrmsx	Rms value of viscous acceleration for the vis_xaver_range
num	Mean value of viscosity
nusmagm	Mean value of Smagorinsky viscosity
nusmagmin	Min value of Smagorinsky viscosity
nusmagmax	Max value of Smagorinsky viscosity
nu_LES	Mean value of Smagorinsky viscosity
visc_heatm	Mean value of viscous heating
qfviscm	$\langle \boldsymbol{q}\cdot\boldsymbol{f}_{\rm visc}\rangle$
ufviscm	$\langle \boldsymbol{u}\cdot\boldsymbol{f}_{\rm visc}\rangle$
Sij2m	$\left\langle \mathrm{S}^2\right\rangle$
epsK	$\left\langle 2\nu\varrho \mathrm{S}^2\right\rangle$
slope_c_max	Max value of characteric speed of slope limited diffusion
dtnu	$\delta t/[c_{\delta t,\mathrm{v}}\,\delta x^2/\nu_{\rm max}]$ (time step relative to viscous time step; see § ??)
meshRemax	Max mesh Reynolds number
Reshock	Mesh Reynolds number at shock

1.4 List of parameters for 'video.in'

The following table lists all (at the time of writing, 2018 年 10 月 23 日) possible inputs to the file 'video.in'.

Variable	Meaning
	Module 'hydro.f90'
uu	velocity vector $\boldsymbol{u}$; writes all three components separately to files 'u[xyz].{xz,yz,xy,xy2}'
u2	kinetic energy density $\boldsymbol{u}^2$; writes 'u2.{xz,yz,xy,xy2}'
oo	vorticity vector $\boldsymbol{\omega} = \nabla \times \boldsymbol{u}$; writes all three components separately to files 'oo[xyz].{xz,yz,xy,xy2}'
o2	enstrophy $\omega^2 = \lvert\nabla \times \boldsymbol{u}\rvert^2$; writes 'o2.{xz,yz,xy,xy2}'
divu	$\boldsymbol{\nabla} \cdot \boldsymbol{u}$; writes 'divu.{xz,yz,xy,xy2}'
mach	Mach number squared Ma^2; writes 'mach.{xz,yz,xy,xy2}'
	Module 'density.f90'
lnrho	logarithmic density $\ln \rho$; writes 'lnrho.{xz,yz,xy,xy2}'
rho	density ρ; writes 'rho.{xz,yz,xy,xy2}'
	Module 'entropy.f90'
ss	entropy s; writes 'ss.{xz,yz,xy,xy2}'
pp	pressure p; writes 'pp.{xz,yz,xy,xy2}'
	Module 'temperature_idealgas.f90'
lnTT	logarithmic temperature $\ln T$; writes 'lnTT.{xz,yz,xy,xy2}'
TT	temperature T; writes 'TT.{xz,yz,xy,xy2}'
	Module 'shock.f90'
shock	shock viscosity ν_{shock}; writes 'shock.{xz,yz,xy,xy2}'
	Module 'eos_ionization.f90'
yH	ionization fraction y_{H}; writes 'yH.{xz,yz,xy,xy2}'
	Module 'radiation_ray.f90'
Qrad	radiative heating rate Q_{rad}; writes 'Qrad.{xz,yz,xy,xy2}'
Isurf	surface intensity I_{surf} (?); writes 'Isurf.xz'
	Module 'magnetic.f90'
aa	magnetic vector potential $\boldsymbol{A}$; writes 'aa[xyz].{xz,yz,xy,xy2}'

bb	magnetic flux density $\boldsymbol{B}$; writes 'bb[xyz].{xz,yz,xy,xy2}'
b2	magnetic energy density $\boldsymbol{B}^2$; writes 'b2.{xz,yz,xy,xy2}'
jj	current density $\boldsymbol{j}$; writes 'jj[xyz].{xz,yz,xy,xy2}'
j2	current density squared $\boldsymbol{j}^2$; writes 'j2.{xz,yz,xy,xy2}'
jb	$\boldsymbol{jB}$; writes 'jb.{xz,yz,xy,xy2}'
beta1	inverse plasma beta $\boldsymbol{B}^2/(2\mu_0 p)$; writes 'beta1.{xz,yz,xy,xy2}'
Poynting	Poynting vector $\eta\boldsymbol{j} \times \boldsymbol{B} - (\boldsymbol{u} \times \boldsymbol{B}) \times \boldsymbol{B}/\mu_0$; writes 'Poynting[xyz].{xz,yz,xy,xy2}'
ab	magnetic helicity density $\boldsymbol{A} \cdot \boldsymbol{B}$; writes 'ab[xyz].{xz,yz,xy,xy2}'
	Module 'pscalar.f90'
lncc	logarithmic density of passive scalar $\ln c$; writes 'lncc.{xz,yz,xy,xy2}'
	Module 'cosmicray.f90'
ecr	energy $e_{\rm cr}$ of cosmic rays (?); writes 'ec.{xz,yz,xy,xy2}'

1.5 List of parameters for 'phiaver.in'

The following table lists all (at the time of writing, November 2003) possible inputs to the file 'phiaver.in'.

Variable	Meaning
	Module 'cdata.f90'
rcylmphi	cylindrical radius $\varpi = \sqrt{x^2 + y^2}$ (useful for debugging azimuthal averages)
phimphi	azimuthal angle $\varphi = \arctan\frac{y}{x}$ (useful for debugging)
zmphi	z-coordinate (useful for debugging)
rmphi	spherical radius $r = \sqrt{\varpi^2 + z^2}$ (useful for debugging)
	Module 'hydro.f90'
urmphi	$\langle u_\varpi \rangle_\varphi$ [cyl. polar coords (ϖ, φ, z)]
upmphi	$\langle u_\varphi \rangle_\varphi$
uzmphi	$\langle u_z \rangle_\varphi$
ursphmphi	$\langle u_r \rangle_\varphi$
uthmphi	$\langle u_\vartheta \rangle_\varphi$
uumphi	shorthand for urmphi, upmphi and uzmphi together

uusphmphi	shorthand for ursphmphi, uthmphi and upmphi together
u2mphi	$\langle \boldsymbol{u}^2 \rangle_\varphi$

Module 'density.f90'	
lnrhomphi	$\langle \ln \varrho \rangle_\varphi$
rhomphi	$\langle \varrho \rangle_\varphi$

Module 'entropy.f90'	
ssmphi	$\langle s \rangle_\varphi$
cs2mphi	$\langle c_s^2 \rangle_\varphi$

Module 'magnetic.f90'	
jbmphi	$\langle \boldsymbol{J} \cdot \boldsymbol{B} \rangle_\varphi$
brmphi	$\langle B_\varpi \rangle_\varphi$ [cyl. polar coords (ϖ, φ, z)]
bpmphi	$\langle B_\varphi \rangle_\varphi$
bzmphi	$\langle B_z \rangle_\varphi$
bbmphi	shorthand for brmphi, bpmphi and bzmphi together
bbsphmphi	shorthand for brsphmphi, bthmphi and bpmphi together
b2mphi	$\left\langle \boldsymbol{B}^2 \right\rangle_\varphi$
brsphmphi	$\langle B_r \rangle_\varphi$
bthmphi	$\langle B_\vartheta \rangle_\varphi$

Module 'anelastic.f90'	
lnrhomphi	$\langle \ln \varrho \rangle_\varphi$
rhomphi	$\langle \varrho \rangle_\varphi$

Module 'entropy_anelastic.f90'	
ssmphi	$\langle s \rangle_\varphi$
cs2mphi	$\langle c_s^2 \rangle_\varphi$

Module 'magnetic_shearboxJ.f90'	
jbmphi	$\langle \boldsymbol{J} \cdot \boldsymbol{B} \rangle_\varphi$
brmphi	$\langle B_\varpi \rangle_\varphi$ [cyl. polar coords (ϖ, φ, z)]
bpmphi	$\langle B_\varphi \rangle_\varphi$
bzmphi	$\langle B_z \rangle_\varphi$
bbmphi	shorthand for brmphi, bpmphi and bzmphi together
bbsphmphi	shorthand for brsphmphi, bthmphi and bpmphi together
b2mphi	$\left\langle \boldsymbol{B}^2 \right\rangle_\varphi$
brsphmphi	$\langle B_r \rangle_\varphi$
bthmphi	$\langle B_\vartheta \rangle_\varphi$

1.6 List of parameters for 'xyaver.in'

The following table lists possible inputs to the file 'xyaver.in'. This list is not complete and maybe outdated.

Variable	Meaning
	Module 'hydro.f90'
u2mz	$\langle \boldsymbol{u}^2 \rangle_{xy}$
o2mz	$\left\langle \boldsymbol{W}^2 \right\rangle_{xy}$
divu2mz	$\langle (\nabla \cdot \boldsymbol{u})^2 \rangle_{xy}$
curlru2mz	$\langle (\nabla \times \varrho \boldsymbol{U})^2 \rangle_{xy}$
divru2mz	$\langle (\nabla \cdot \varrho \boldsymbol{u})^2 \rangle_{xy}$
fmasszmz	$\langle \varrho u_z \rangle_{xy}$
fkinzmz	$\left\langle \frac{1}{2} \varrho \boldsymbol{u}^2 u_z \right\rangle_{xy}$
uxmz	$\langle u_x \rangle_{xy}$ (horiz. averaged x velocity)
uymz	$\langle u_y \rangle_{xy}$
uzmz	$\langle u_z \rangle_{xy}$
uzupmz	$\langle u_{z\uparrow} \rangle_{xy}$
uzdownmz	$\langle u_{z\downarrow} \rangle_{xy}$
ruzupmz	$\langle \varrho u_{z\uparrow} \rangle_{xy}$
ruzdownmz	$\langle \varrho u_{z\downarrow} \rangle_{xy}$
divumz	$\langle \mathrm{div} \boldsymbol{u} \rangle_{xy}$
uzdivumz	$\langle u_z \mathrm{div} \boldsymbol{u} \rangle_{xy}$
oxmz	$\langle \omega_x \rangle_{xy}$
oymz	$\langle \omega_y \rangle_{xy}$
ozmz	$\langle \omega_z \rangle_{xy}$
ux2mz	$\langle u_x^2 \rangle_{xy}$
uy2mz	$\left\langle u_y^2 \right\rangle_{xy}$
uz2mz	$\langle u_z^2 \rangle_{xy}$
ox2mz	$\langle \omega_x^2 \rangle_{xy}$
oy2mz	$\left\langle \omega_y^2 \right\rangle_{xy}$
oz2mz	$\langle \omega_z^2 \rangle_{xy}$
ruxmz	$\langle \varrho u_x \rangle_{xy}$
ruymz	$\langle \varrho u_y \rangle_{xy}$
ruzmz	$\langle \varrho u_z \rangle_{xy}$
rux2mz	$\langle \varrho u_x^2 \rangle_{xy}$
ruy2mz	$\left\langle \varrho u_y^2 \right\rangle_{xy}$

ruz2mz	$\langle \varrho u_z^2 \rangle_{xy}$
uxuymz	$\langle u_x u_y \rangle_{xy}$
uxuzmz	$\langle u_x u_z \rangle_{xy}$
uyuzmz	$\langle u_y u_z \rangle_{xy}$
ruxuymz	$\langle \rho u_x u_y \rangle_{xy}$
ruxuzmz	$\langle \rho u_x u_z \rangle_{xy}$
ruyuzmz	$\langle \rho u_y u_z \rangle_{xy}$
ruxuy2mz	$\langle \rho u_x u_y \rangle_{xy}$
ruxuz2mz	$\langle \rho u_x u_z \rangle_{xy}$
ruyuz2mz	$\langle \rho u_y u_z \rangle_{xy}$
oxuxxmz	$\langle \omega_x u_{x,x} \rangle_{xy}$
oyuxymz	$\langle \omega_y u_{x,y} \rangle_{xy}$
oxuyxmz	$\langle \omega_x u_{y,x} \rangle_{xy}$
oyuyymz	$\langle \omega_y u_{y,y} \rangle_{xy}$
oxuzxmz	$\langle \omega_x u_{z,x} \rangle_{xy}$
oyuzymz	$\langle \omega_y u_{z,y} \rangle_{xy}$
uyxuzxmz	$\langle u_{y,x} u_{z,x} \rangle_{xy}$
uyyuzymz	$\langle u_{y,y} u_{z,y} \rangle_{xy}$
uyzuzzmz	$\langle u_{y,z} u_{z,z} \rangle_{xy}$
ekinmz	$\left\langle \frac{1}{2} \varrho \boldsymbol{u}^2 \right\rangle_{xy}$
oumz	$\langle \boldsymbol{\omega} \cdot \boldsymbol{u} \rangle_{xy}$
Remz	$\langle \frac{\lvert \boldsymbol{u} \cdot \boldsymbol{u} \rvert}{\left\lvert \frac{\partial}{\partial x_j} (\nu \mathrm{S}_{ij}) \right\rvert} \rangle_{xy}$
oguxmz	$\langle (\boldsymbol{\omega} \cdot \nabla \boldsymbol{u})_x \rangle_{xy}$
oguymz	$\langle (\boldsymbol{\omega} \cdot \nabla \boldsymbol{u})_y \rangle_{xy}$
oguzmz	$\langle (\boldsymbol{\omega} \cdot \nabla \boldsymbol{u})_z \rangle_{xy}$
ogux2mz	$\langle (\boldsymbol{\omega} \cdot \nabla \boldsymbol{u})_x^2 \rangle_{xy}$
oguy2mz	$\langle (\boldsymbol{\omega} \cdot \nabla \boldsymbol{u})_y^2 \rangle_{xy}$
oguz2mz	$\langle (\boldsymbol{\omega} \cdot \nabla \boldsymbol{u})_z^2 \rangle_{xy}$
oxdivumz	$\langle \omega_x \nabla \cdot \boldsymbol{u} \rangle_{xy}$
oydivumz	$\langle \omega_y \nabla \cdot \boldsymbol{u} \rangle_{xy}$
ozdivumz	$\langle \omega_z \nabla \cdot \boldsymbol{u} \rangle_{xy}$
oxdivu2mz	$\langle (\omega_x nabla \cdot \boldsymbol{u})^2 \rangle_{xy}$
oydivu2mz	$\langle (\omega_y \nabla \cdot \boldsymbol{u})^2 \rangle_{xy}$
ozdivu2mz	$\langle (\omega_z \nabla \cdot \boldsymbol{u})^2 \rangle_{xy}$
accpowzmz	$\langle (u_z D u_z / Dt)^2 \rangle_{xy}$
accpowzupmz	$\langle (u_z D u_z / Dt)^2 \rangle_{xy+}$
accpowzdownmz	$\langle (u_z D u_z / Dt)^2 \rangle_{xy-}$

fkinxmx	$\left\langle \frac{1}{2}\varrho\boldsymbol{u}^2 u_x \right\rangle_{yz}$
	Module 'density.f90'
rhomz	$\langle\varrho\rangle_{xy}$
rho2mz	$\langle\varrho^2\rangle_{xy}$
gzlnrhomz	$\langle\nabla_z \ln\varrho\rangle_{xy}$
uglnrhomz	$\langle\boldsymbol{u}\cdot\nabla\ln\varrho\rangle_{xy}$
ugrhomz	$\langle\boldsymbol{u}\cdot\nabla\varrho\rangle_{xy}$
uygzlnrhomz	$\langle u_y\nabla_z \ln\varrho\rangle_{xy}$
uzgylnrhomz	$\langle u_z\nabla_y \ln\varrho\rangle_{xy}$
rho2mx	$\langle\varrho^2\rangle_{yz}$
	Module 'entropy.f90'
fradz	$\langle F_{\rm rad}\rangle_{xy}$
fconvz	$\langle c_p\varrho u_z T\rangle_{xy}$
ssmz	$\langle s\rangle_{xy}$
ss2mz	$\langle s^2\rangle_{xy}$
ppmz	$\langle p\rangle_{xy}$
TTmz	$\langle T\rangle_{xy}$
TT2mz	$\langle T^2\rangle_{xy}$
uxTTmz	$\langle u_x T\rangle_{xy}$
uyTTmz	$\langle u_y T\rangle_{xy}$
uzTTmz	$\langle u_z T\rangle_{xy}$
gTxgsxmz	$\langle(\nabla T\times\nabla s)_x\rangle_{xy}$
gTxgsymz	$\langle(\nabla T\times\nabla s)_y\rangle_{xy}$
gTxgszmz	$\langle(\nabla T\times\nabla s)_z\rangle_{xy}$
gTxgsx2mz	$\langle(\nabla T\times\nabla s)_x^2\rangle_{xy}$
gTxgsy2mz	$\left\langle(\nabla T\times\nabla s)_y^2\right\rangle_{xy}$
gTxgsz2mz	$\langle(\nabla T\times\nabla s)_z^2\rangle_{xy}$
fradz_kramers	$F_{\rm rad}$ (from Kramers' opacity)
fradz_Kprof	$F_{\rm rad}$ (from Kprof)
fradz_constchi	$F_{\rm rad}$ (from chi_const)
fturbz	$\langle\varrho T\chi_t\nabla_z s\rangle_{xy}$ (turbulent heat flux)
fturbtz	$\langle\varrho T\chi_t 0\nabla_z s\rangle_{xy}$ (turbulent heat flux)
fturbmz	$\langle\varrho T\chi_t 0\nabla_z \overline{s}\rangle_{xy}$ (turbulent heat flux)
fturbfz	$\langle\varrho T\chi_t 0\nabla_z s'\rangle_{xy}$ (turbulent heat flux)
dcoolz	surface cooling flux
heatmz	heating
Kkramersmz	$\left\langle K_0 T^(3-b)/rho^(a+1)\right\rangle_{xy}$

ethmz	$\langle \varrho e \rangle_{xy}$

Module 'magnetic.f90'

axmz	$\langle \mathcal{A}_x \rangle_{xy}$
aymz	$\langle \mathcal{A}_y \rangle_{xy}$
azmz	$\langle \mathcal{A}_z \rangle_{xy}$
abuxmz	$\langle (\boldsymbol{A} \cdot \boldsymbol{B}) u_x \rangle_{xy}$
abuymz	$\langle (\boldsymbol{A} \cdot \boldsymbol{B}) u_y \rangle_{xy}$
abuzmz	$\langle (\boldsymbol{A} \cdot \boldsymbol{B}) u_z \rangle_{xy}$
uabxmz	$\langle (\boldsymbol{u} \cdot \boldsymbol{A}) B_x \rangle_{xy}$
uabymz	$\langle (\boldsymbol{u} \cdot \boldsymbol{A}) B_y \rangle_{xy}$
uabzmz	$\langle (\boldsymbol{u} \cdot \boldsymbol{A}) B_z \rangle_{xy}$
bbxmz	$\langle \mathcal{B}'_x \rangle_{xy}$
bbymz	$\left\langle \mathcal{B}'_y \right\rangle_{xy}$
bbzmz	$\langle \mathcal{B}'_z \rangle_{xy}$
bxmz	$\langle \mathcal{B}_x \rangle_{xy}$
bymz	$\langle \mathcal{B}_y \rangle_{xy}$
bzmz	$\langle \mathcal{B}_z \rangle_{xy}$
jxmz	$\langle \mathcal{J}_x \rangle_{xy}$
jymz	$\langle \mathcal{J}_y \rangle_{xy}$
jzmz	$\langle \mathcal{J}_z \rangle_{xy}$
Exmz	$\langle \mathcal{E}_x \rangle_{xy}$
Eymz	$\langle \mathcal{E}_y \rangle_{xy}$
Ezmz	$\langle \mathcal{E}_z \rangle_{xy}$
bx2mz	$\langle B_x^2 \rangle_{xy}$
by2mz	$\left\langle B_y^2 \right\rangle_{xy}$
bz2mz	$\langle B_z^2 \rangle_{xy}$
bx2rmz	$\langle B_x^2 / \varrho \rangle_{xy}$
by2rmz	$\left\langle B_y^2 / \varrho \right\rangle_{xy}$
bz2rmz	$\langle B_z^2 / \varrho \rangle_{xy}$
beta1mz	$\langle (B^2 / 2\mu_0) / p \rangle_{xy}$
betamz	$\langle \beta \rangle_{xy}$
beta2mz	$\langle \beta^2 \rangle_{xy}$
jbmz	$\langle \boldsymbol{J} \cdot \boldsymbol{B} \rangle \|_{xy}$
d6abmz	$\langle \nabla^6 \boldsymbol{A} \cdot \boldsymbol{B} \rangle \|_{xy}$
d6amz1	$\langle \nabla^6 \boldsymbol{A} \rangle_{xy} \|_x$
d6amz2	$\langle \nabla^6 \boldsymbol{A} \rangle_{xy} \|_y$
d6amz3	$\langle \nabla^6 \boldsymbol{A} \rangle_{xy} \|_z$
abmz	$\langle \boldsymbol{A} \cdot \boldsymbol{B} \rangle \|_{xy}$

ubmz	$\langle \boldsymbol{u} \cdot \boldsymbol{B} \rangle \|_{xy}$
uamz	$\langle \boldsymbol{u} \cdot \boldsymbol{A} \rangle \|_{xy}$
uxbxmz	$\langle u_x b_x \rangle \|_{xy}$
uybxmz	$\langle u_y b_x \rangle \|_{xy}$
uzbxmz	$\langle u_z b_x \rangle \|_{xy}$
uxbymz	$\langle u_x b_y \rangle \|_{xy}$
uybymz	$\langle u_y b_y \rangle \|_{xy}$
uzbymz	$\langle u_z b_y \rangle \|_{xy}$
uxbzmz	$\langle u_x b_z \rangle \|_{xy}$
uybzmz	$\langle u_y b_z \rangle \|_{xy}$
uzbzmz	$\langle u_z b_z \rangle \|_{xy}$
examz1	$\langle \boldsymbol{E} \times \boldsymbol{A} \rangle_{xy} \|_x$
examz2	$\langle \boldsymbol{E} \times \boldsymbol{A} \rangle_{xy} \|_y$
examz3	$\langle \boldsymbol{E} \times \boldsymbol{A} \rangle_{xy} \|_z$
e3xamz1	$\langle \boldsymbol{E}_{hyper3} \times \boldsymbol{A} \rangle_{xy} \|_x$
e3xamz2	$\langle \boldsymbol{E}_{hyper3} \times \boldsymbol{A} \rangle_{xy} \|_y$
e3xamz3	$\langle \boldsymbol{E}_{hyper3} \times \boldsymbol{A} \rangle_{xy} \|_z$
etatotalmz	$\langle \eta \rangle_{xy}$
bxbymz	$\langle B_x B_y \rangle_{xy}$
bxbzmz	$\langle B_x B_z \rangle_{xy}$
bybzmz	$\langle B_y B_z \rangle_{xy}$
b2mz	$\left\langle \boldsymbol{B}^2 \right\rangle_{xy}$
bf2mz	$\left\langle \boldsymbol{B}'^2 \right\rangle_{xy}$
j2mz	$\left\langle \boldsymbol{j}^2 \right\rangle_{xy}$
poynzmz	Averaged poynting flux in z direction
epsMmz	$\left\langle \eta\mu_0 \boldsymbol{j}^2 \right\rangle_{xy}$

Module ‘bfield.f90’

bmz	$\langle B \rangle_{xy}$
b2mz	$\langle B^2 \rangle_{xy}$
bxmz	$\langle B_x \rangle_{xy}$
bymz	$\langle B_y \rangle_{xy}$
bzmz	$\langle B_z \rangle_{xy}$
bx2mz	$\langle B_x^2 \rangle_{xy}$
by2mz	$\langle B_y^2 \rangle_{xy}$
bz2mz	$\langle B_z^2 \rangle_{xy}$
bxbymz	$\langle B_x B_y \rangle_{xy}$
bxbzmz	$\langle B_x B_z \rangle_{xy}$
bybzmz	$\langle B_y B_z \rangle_{xy}$

betamz	$\langle\beta\rangle_{xy}$
beta2mz	$\langle\beta^2\rangle_{xy}$

Module 'density_stratified.f90'

drhomz	$\langle\Delta\rho/\rho_0\rangle_{xy}$
drho2mz	$\langle(\Delta\rho/\rho_0)^2\rangle_{xy}$

Module 'gravity_simple.f90'

epotmz	$\langle\varrho\Phi_{\rm grav}\rangle_{xy}$
epotuzmz	$\langle\varrho\Phi_{\rm grav}u_z\rangle_{xy}$ (potential energy flux)

Module 'magnetic_shearboxJ.f90'

axmz	$\langle\mathcal{A}_x\rangle_{xy}$
aymz	$\langle\mathcal{A}_y\rangle_{xy}$
azmz	$\langle\mathcal{A}_z\rangle_{xy}$
abuxmz	$\langle(\boldsymbol{A}\cdot\boldsymbol{B})u_x\rangle_{xy}$
abuymz	$\langle(\boldsymbol{A}\cdot\boldsymbol{B})u_y\rangle_{xy}$
abuzmz	$\langle(\boldsymbol{A}\cdot\boldsymbol{B})u_z\rangle_{xy}$
uabxmz	$\langle(\boldsymbol{u}\cdot\boldsymbol{A})B_x\rangle_{xy}$
uabymz	$\langle(\boldsymbol{u}\cdot\boldsymbol{A})B_y\rangle_{xy}$
uabzmz	$\langle(\boldsymbol{u}\cdot\boldsymbol{A})B_z\rangle_{xy}$
bbxmz	$\langle\mathcal{B}'_x\rangle_{xy}$
bbymz	$\langle\mathcal{B}'_y\rangle_{xy}$
bbzmz	$\langle\mathcal{B}'_z\rangle_{xy}$
bxmz	$\langle\mathcal{B}_x\rangle_{xy}$
bymz	$\langle\mathcal{B}_y\rangle_{xy}$
bzmz	$\langle\mathcal{B}_z\rangle_{xy}$
jxmz	$\langle\mathcal{J}_x\rangle_{xy}$
jymz	$\langle\mathcal{J}_y\rangle_{xy}$
jzmz	$\langle\mathcal{J}_z\rangle_{xy}$
Exmz	$\langle\mathcal{E}_x\rangle_{xy}$
Eymz	$\langle\mathcal{E}_y\rangle_{xy}$
Ezmz	$\langle\mathcal{E}_z\rangle_{xy}$
bx2mz	$\langle B_x^2\rangle_{xy}$
by2mz	$\langle B_y^2\rangle_{xy}$
bz2mz	$\langle B_z^2\rangle_{xy}$
bx2rmz	$\langle B_x^2/\varrho\rangle_{xy}$
by2rmz	$\langle B_y^2/\varrho\rangle_{xy}$
bz2rmz	$\langle B_z^2/\varrho\rangle_{xy}$
beta1mz	$\langle(B^2/2\mu_0)/p\rangle_{xy}$

betamz	$\langle\beta\rangle_{xy}$
beta2mz	$\langle\beta^2\rangle_{xy}$
jbmz	$\langle\boldsymbol{J}\cdot\boldsymbol{B}\rangle\,\|_{xy}$
d6abmz	$\langle\nabla^6\boldsymbol{A}\cdot\boldsymbol{B}\rangle\,\|_{xy}$
d6amz1	$\langle\nabla^6\boldsymbol{A}\rangle_{xy}\,\|_x$
d6amz2	$\langle\nabla^6\boldsymbol{A}\rangle_{xy}\,\|_y$
d6amz3	$\langle\nabla^6\boldsymbol{A}\rangle_{xy}\,\|_z$
abmz	$\langle\boldsymbol{A}\cdot\boldsymbol{B}\rangle\,\|_{xy}$
ubmz	$\langle\boldsymbol{u}\cdot\boldsymbol{B}\rangle\,\|_{xy}$
uamz	$\langle\boldsymbol{u}\cdot\boldsymbol{A}\rangle\,\|_{xy}$
uxbxmz	$\langle u_x b_x\rangle\,\|_{xy}$
uybxmz	$\langle u_y b_x\rangle\,\|_{xy}$
uzbxmz	$\langle u_z b_x\rangle\,\|_{xy}$
uxbymz	$\langle u_x b_y\rangle\,\|_{xy}$
uybymz	$\langle u_y b_y\rangle\,\|_{xy}$
uzbymz	$\langle u_z b_y\rangle\,\|_{xy}$
uxbzmz	$\langle u_x b_z\rangle\,\|_{xy}$
uybzmz	$\langle u_y b_z\rangle\,\|_{xy}$
uzbzmz	$\langle u_z b_z\rangle\,\|_{xy}$
examz1	$\langle\boldsymbol{E}\times\boldsymbol{A}\rangle_{xy}\,\|_x$
examz2	$\langle\boldsymbol{E}\times\boldsymbol{A}\rangle_{xy}\,\|_y$
examz3	$\langle\boldsymbol{E}\times\boldsymbol{A}\rangle_{xy}\,\|_z$
e3xamz1	$\langle\boldsymbol{E}_{hyper3}\times\boldsymbol{A}\rangle_{xy}\,\|_x$
e3xamz2	$\langle\boldsymbol{E}_{hyper3}\times\boldsymbol{A}\rangle_{xy}\,\|_y$
e3xamz3	$\langle\boldsymbol{E}_{hyper3}\times\boldsymbol{A}\rangle_{xy}\,\|_z$
etatotalmz	$\langle\eta\rangle_{xy}$
bxbymz	$\langle B_x B_y\rangle_{xy}$
bxbzmz	$\langle B_x B_z\rangle_{xy}$
bybzmz	$\langle B_y B_z\rangle_{xy}$
b2mz	$\left\langle\boldsymbol{B}^2\right\rangle_{xy}$
bf2mz	$\left\langle\boldsymbol{B}'^2\right\rangle_{xy}$
j2mz	$\left\langle\boldsymbol{j}^2\right\rangle_{xy}$
poynzmz	Averaged poynting flux in z direction
epsMmz	$\left\langle\eta\mu_0\boldsymbol{j}^2\right\rangle_{xy}$
Module 'meanfield.f90'	
qpmz	$\langle q_p\rangle_{xy}$
Module 'shock_highorder.f90'	

Module 'temperature_idealgas.f90'	
ppmz	$\langle p\rangle_{xy}$
TTmz	$\langle T\rangle_{xy}$
ethmz	$\langle e_{\rm th}\rangle_{xy}$
fpresxmz	$\langle(\nabla p)_x\rangle_{xy}$
fpresymz	$\langle(\nabla p)_y\rangle_{xy}$
fpreszmz	$\langle(\nabla p)_z\rangle_{xy}$
TT2mz	$\langle T^2\rangle_{xy}$
uxTmz	$\langle u_xT\rangle_{xy}$
uyTmz	$\langle u_yT\rangle_{xy}$
uzTmz	$\langle u_zT\rangle_{xy}$
fradmz	$\langle F_{\rm rad}\rangle_{xy}$
fconvmz	$\langle c_p\varrho u_zT\rangle_{xy}$
Module 'temperature_ionization.f90'	
puzmz	$\langle pu_z\rangle_{xy}$
pr1mz	$\langle p/\varrho\rangle_{xy}$
eruzmz	$\langle e\varrho u_z\rangle_{xy}$
ffakez	$\langle \varrho u_zc_pT\rangle_{xy}$
mumz	$\langle\mu\rangle_{xy}$
TTmz	$\langle T\rangle_{xy}$
ssmz	$\langle s\rangle_{xy}$
eemz	$\langle e\rangle_{xy}$
ppmz	$\langle p\rangle_{xy}$
Module 'thermal_energy.f90'	
ppmz	$\langle p\rangle_{xy}$
TTmz	$\langle T\rangle_{xy}$
Module 'viscosity.f90'	
fviscmz	$\langle 2\nu\varrho u_i\mathcal{S}_{iz}\rangle_{xy}$ (z-component of viscous flux)
fviscsmmz	$\langle 2\nu_{\rm Smag}\varrho u_i\mathcal{S}_{iz}\rangle_{xy}$ (z-component of viscous flux)
epsKmz	$\left\langle 2\nu\varrho \mathrm{S}^2\right\rangle_{xy}$

1.7 List of parameters for 'xzaver.in'

The following table lists possible inputs to the file 'xzaver.in'. This list is not complete and maybe outdated.

Variable	Meaning
	Module 'hydro.f90'
uxmy	$\langle u_x \rangle_{xz}$
uymy	$\langle u_y \rangle_{xz}$
uzmy	$\langle u_z \rangle_{xz}$
oumy	$\langle \boldsymbol{\omega} \cdot \boldsymbol{u} \rangle_{xz}$
	Module 'density.f90'
rhomy	$\langle \varrho \rangle_{xz}$
	Module 'entropy.f90'
ssmy	$\langle s \rangle_{xz}$
ppmy	$\langle p \rangle_{xz}$
TTmy	$\langle T \rangle_{xz}$
	Module 'magnetic.f90'
bxmy	$\langle B_x \rangle_{xz}$
bymy	$\langle B_y \rangle_{xz}$
bzmy	$\langle B_z \rangle_{xz}$
bx2my	$\langle B_x^2 \rangle_{xz}$
by2my	$\left\langle B_y^2 \right\rangle_{xz}$
bz2my	$\langle B_z^2 \rangle_{xz}$
bxbymy	$\langle B_x B_y \rangle_{xz}$
bxbzmy	$\langle B_x B_z \rangle_{xz}$
bybzmy	$\langle B_y B_z \rangle_{xz}$
	Module 'density_stratified.f90'
drhomy	$\langle \Delta\rho/\rho_0 \rangle_{xz}$
drho2my	$\langle (\Delta\rho/\rho_0)^2 \rangle_{xz}$
	Module 'gravity_simple.f90'
epotmy	$\langle \varrho \Phi_{\rm grav} \rangle_{xz}$
	Module 'magnetic_shearboxJ.f90'
bxmy	$\langle B_x \rangle_{xz}$
bymy	$\langle B_y \rangle_{xz}$
bzmy	$\langle B_z \rangle_{xz}$
bx2my	$\langle B_x^2 \rangle_{xz}$
by2my	$\left\langle B_y^2 \right\rangle_{xz}$

bz2my	$\langle B_z^2\rangle_{xz}$
bxbymy	$\langle B_x B_y\rangle_{xz}$
bxbzmy	$\langle B_x B_z\rangle_{xz}$
bybzmy	$\langle B_y B_z\rangle_{xz}$
Module 'shock_highorder.f90'	
Module 'temperature_idealgas.f90'	
ppmy	$\langle p\rangle_{xz}$
TTmy	$\langle T\rangle_{xz}$
Module 'thermal_energy.f90'	
ppmy	$\langle p\rangle_{xz}$
TTmy	$\langle T\rangle_{xz}$

1.8 List of parameters for 'yzaver.in'

The following table lists possible inputs to the file 'yzaver.in'. This list is not complete and maybe outdated.

Variable	Meaning
Module 'hydro.f90'	
uxmx	$\langle u_x\rangle_{yz}$
uymx	$\langle u_y\rangle_{yz}$
uzmx	$\langle u_z\rangle_{yz}$
ruxmx	$\langle \varrho u_x\rangle_{yz}$
ruymx	$\langle \varrho u_y\rangle_{yz}$
ruzmx	$\langle \varrho u_z\rangle_{yz}$
rux2mx	$\langle \rho u_x^2\rangle_{yz}$
ruy2mx	$\langle \rho u_y^2\rangle_{yz}$
ruz2mx	$\langle \rho u_z^2\rangle_{yz}$
ruxuymx	$\langle \rho u_x u_y\rangle_{yz}$
ruxuzmx	$\langle \rho u_x u_z\rangle_{yz}$
ruyuzmx	$\langle \rho u_y u_z\rangle_{yz}$
ux2mx	$\langle u_x^2\rangle_{yz}$
uy2mx	$\langle u_y^2\rangle_{yz}$
uz2mx	$\langle u_z^2\rangle_{yz}$
ox2mx	$\langle \omega_x^2\rangle_{yz}$

oy2mx	$\left\langle\omega_y^2\right\rangle_{yz}$
oz2mx	$\langle\omega_z^2\rangle_{yz}$
uxuymx	$\langle u_x u_y\rangle_{yz}$
uxuzmx	$\langle u_x u_z\rangle_{yz}$
uyuzmx	$\langle u_y u_z\rangle_{yz}$
oumx	$\langle\boldsymbol{\omega}\cdot\boldsymbol{u}\rangle_{yz}$
ekinmx	$\langle\frac{1}{2}\rho u^2\rangle_{xy}$
Module 'density.f90'	
rhomx	$\langle\varrho\rangle_{yz}$
Module 'entropy.f90'	
ssmx	$\langle s\rangle_{yz}$
ss2mx	$\langle s^2\rangle_{yz}$
ppmx	$\langle p\rangle_{yz}$
TTmx	$\langle T\rangle_{yz}$
TT2mx	$\langle T^2\rangle_{yz}$
uxTTmx	$\langle u_x T\rangle_{yz}$
uyTTmx	$\langle u_y T\rangle_{yz}$
uzTTmx	$\langle u_z T\rangle_{yz}$
fconvxmx	$\langle c_p\varrho u_x T\rangle_{yz}$
fradmx	$\langle F_{\rm rad}\rangle_{yz}$
fturbmx	$\langle\varrho T\chi_t\nabla_x s\rangle_{yz}$ (turbulent heat flux)
Kkramersmx	$\left\langle K_0 T^(3-b)/rho^(a+1)\right\rangle_{yz}$
dcoolx	surface cooling flux
fradx_kramers	$F_{\rm rad}$ (from Kramers' opacity)
Module 'magnetic.f90'	
b2mx	$\langle B^2\rangle_{yz}$
bxmx	$\langle B_x\rangle_{yz}$
bymx	$\langle B_y\rangle_{yz}$
bzmx	$\langle B_z\rangle_{yz}$
bx2mx	$\langle B_x^2\rangle_{yz}$
by2mx	$\left\langle B_y^2\right\rangle_{yz}$
bz2mx	$\langle B_z^2\rangle_{yz}$
bxbymx	$\langle B_x B_y\rangle_{yz}$
bxbzmx	$\langle B_x B_z\rangle_{yz}$
bybzmx	$\langle B_y B_z\rangle_{yz}$
betamx	$\langle\beta\rangle_{yz}$
beta2mx	$\langle\beta^2\rangle_{yz}$

etatotalmx	$\langle \eta \rangle_{yz}$
Module 'bfield.f90'	
bmx	$\langle B \rangle_{yz}$
b2mx	$\langle B^2 \rangle_{yz}$
bxmx	$\langle B_x \rangle_{yz}$
bymx	$\langle B_y \rangle_{yz}$
bzmx	$\langle B_z \rangle_{yz}$
bx2mx	$\langle B_x^2 \rangle_{yz}$
by2mx	$\langle B_y^2 \rangle_{yz}$
bz2mx	$\langle B_z^2 \rangle_{yz}$
bxbymx	$\langle B_x B_y \rangle_{yz}$
bxbzmx	$\langle B_x B_z \rangle_{yz}$
bybzmx	$\langle B_y B_z \rangle_{yz}$
betamx	$\langle \beta \rangle_{yz}$
beta2mx	$\langle \beta^2 \rangle_{yz}$
Module 'density_stratified.f90'	
drhomx	$\langle \Delta\rho/\rho_0 \rangle_{yz}$
drho2mx	$\langle (\Delta\rho/\rho_0)^2 \rangle_{yz}$
Module 'gravity_simple.f90'	
epotmx	$\langle \varrho \Phi_{\rm grav} \rangle_{yz}$
epotuxmx	$\langle \varrho \Phi_{\rm grav} u_x \rangle_{yz}$ (potential energy flux)
Module 'magnetic_shearboxJ.f90'	
b2mx	$\langle B^2 \rangle_{yz}$
bxmx	$\langle B_x \rangle_{yz}$
bymx	$\langle B_y \rangle_{yz}$
bzmx	$\langle B_z \rangle_{yz}$
bx2mx	$\langle B_x^2 \rangle_{yz}$
by2mx	$\langle B_y^2 \rangle_{yz}$
bz2mx	$\langle B_z^2 \rangle_{yz}$
bxbymx	$\langle B_x B_y \rangle_{yz}$
bxbzmx	$\langle B_x B_z \rangle_{yz}$
bybzmx	$\langle B_y B_z \rangle_{yz}$
betamx	$\langle \beta \rangle_{yz}$
beta2mx	$\langle \beta^2 \rangle_{yz}$
etatotalmx	$\langle \eta \rangle_{yz}$

	Module 'shock_highorder.f90'
	Module 'temperature_idealgas.f90'
ppmx	$\langle p\rangle_{yz}$
TTmx	$\langle T\rangle_{yz}$
	Module 'thermal_energy.f90'
ppmx	$\langle p\rangle_{yz}$
TTmx	$\langle T\rangle_{yz}$
	Module 'viscosity.f90'
fviscmx	$\langle 2\nu\varrho u_i\mathcal{S}_{ix}\rangle_{yz}$ (x-component of viscous flux)
numx	$\langle\nu\rangle_{yz}$ (yz-averaged viscosity)

1.9 List of parameters for 'yaver.in'

The following table lists possible inputs to the file 'yaver.in'. This list is not complete and maybe outdated.

Variable	Meaning
	Module 'hydro.f90'
uxmxz	$\langle u_x\rangle_y$
uymxz	$\langle u_y\rangle_y$
uzmxz	$\langle u_z\rangle_y$
ux2mxz	$\langle u_x^2\rangle_y$
uy2mxz	$\langle u_y^2\rangle_y$
uz2mxz	$\langle u_z^2\rangle_y$
uxuymxz	$\langle u_xu_y\rangle_y$
uxuzmxz	$\langle u_xu_z\rangle_y$
uyuzmxz	$\langle u_yu_z\rangle_y$
oumxz	$\langle\boldsymbol{\omega}\cdot\boldsymbol{u}\rangle_y$
	Module 'density.f90'
rhomxz	$\langle\varrho\rangle_y$
	Module 'entropy.f90'
TTmxz	$\langle T\rangle_y$
ssmxz	$\langle s\rangle_y$

Module ‘magnetic.f90’	
b2mxz	$\left\langle \boldsymbol{B}^2 \right\rangle_y$
axmxz	$\langle A_x \rangle_y$
aymxz	$\langle A_y \rangle_y$
azmxz	$\langle A_z \rangle_y$
bx1mxz	$\langle \lvert B_x \rvert \rangle_y$
by1mxz	$\langle \lvert B_y \rvert \rangle_y$
bz1mxz	$\langle \lvert B_z \rvert \rangle_y$
bxmxz	$\langle B_x \rangle_y$
bymxz	$\langle B_y \rangle_y$
bzmxz	$\langle B_z \rangle_y$
jxmxz	$\langle J_x \rangle_y$
jymxz	$\langle J_y \rangle_y$
jzmxz	$\langle J_z \rangle_y$
bx2mxz	$\langle B_x^2 \rangle_y$
by2mxz	$\left\langle B_y^2 \right\rangle_y$
bz2mxz	$\langle B_z^2 \rangle_y$
bxbymxz	$\langle B_x B_y \rangle_y$
bxbzmxz	$\langle B_x B_z \rangle_y$
bybzmxz	$\langle B_y B_z \rangle_y$
uybxmxz	$\langle U_y B_x \rangle_y$
uybzmxz	$\langle U_y B_z \rangle_y$
Exmxz	$\langle \mathcal{E}_x \rangle_y$
Eymxz	$\langle \mathcal{E}_y \rangle_y$
Ezmxz	$\langle \mathcal{E}_z \rangle_y$
vAmxz	$\langle v_A^2 \rangle_y$
Module ‘density_stratified.f90’	
drhomxz	$\langle \Delta\rho/\rho_0 \rangle_y$
drho2mxz	$\langle (\Delta\rho/\rho_0)^2 \rangle_y$
Module ‘magnetic_shearboxJ.f90’	
b2mxz	$\left\langle \boldsymbol{B}^2 \right\rangle_y$
axmxz	$\langle A_x \rangle_y$
aymxz	$\langle A_y \rangle_y$
azmxz	$\langle A_z \rangle_y$
bx1mxz	$\langle \lvert B_x \rvert \rangle_y$
by1mxz	$\langle \lvert B_y \rvert \rangle_y$
bz1mxz	$\langle \lvert B_z \rvert \rangle_y$

bxmxz	$\langle B_x \rangle_y$	
bymxz	$\langle B_y \rangle_y$	
bzmxz	$\langle B_z \rangle_y$	
jxmxz	$\langle J_x \rangle_y$	
jymxz	$\langle J_y \rangle_y$	
jzmxz	$\langle J_z \rangle_y$	
bx2mxz	$\langle B_x^2 \rangle_y$	
by2mxz	$\langle B_y^2 \rangle_y$	
bz2mxz	$\langle B_z^2 \rangle_y$	
bxbymxz	$\langle B_x B_y \rangle_y$	
bxbzmxz	$\langle B_x B_z \rangle_y$	
bybzmxz	$\langle B_y B_z \rangle_y$	
uybxmxz	$\langle U_y B_x \rangle_y$	
uybzmxz	$\langle U_y B_z \rangle_y$	
Exmxz	$\langle \mathcal{E}_x \rangle_y$	
Eymxz	$\langle \mathcal{E}_y \rangle_y$	
Ezmxz	$\langle \mathcal{E}_z \rangle_y$	
vAmxz	$\langle v_A^2 \rangle_y$	
	Module 'meanfield.f90'	
peffmxz	$\langle \mathcal{P}_{\rm eff} \rangle_y$	
alpmxz	$\langle \alpha \rangle_y$	
	Module 'temperature_idealgas.f90'	
TTmxz	$\langle T \rangle_y$	
Emymxz	$\langle Em_y \rangle_y$	Emission in y-direction
	Module 'thermal_energy.f90'	
TTmxz	$\langle T \rangle_y$	

1.10 List of parameters for 'zaver.in'

The following table lists possible inputs to the file 'zaver.in'. This list is not complete and maybe outdated.

Variable	Meaning
	Module 'hydro.f90'

uxmxy	$\langle u_x \rangle_z$
uymxy	$\langle u_y \rangle_z$
uzmxy	$\langle u_z \rangle_z$
uxuymxy	$\langle u_x u_y \rangle_z$
uxuzmxy	$\langle u_x u_z \rangle_z$
uyuzmxy	$\langle u_y u_z \rangle_z$
oxmxy	$\langle \omega_x \rangle_z$
oymxy	$\langle \omega_y \rangle_z$
ozmxy	$\langle \omega_z \rangle_z$
oumxy	$\langle \boldsymbol{\omega} \cdot \boldsymbol{u} \rangle_z$
pvzmxy	$\langle (\omega_z + 2\Omega)/\varrho \rangle_z$ (z component of potential vorticity)
uguxmxy	$\langle (\boldsymbol{u} \cdot \boldsymbol{\nabla} \boldsymbol{u})_x \rangle_z$
uguymxy	$\langle (\boldsymbol{u} \cdot \boldsymbol{\nabla} \boldsymbol{u})_y \rangle_z$
uguzmxy	$\langle (\boldsymbol{u} \cdot \boldsymbol{\nabla} \boldsymbol{u})_z \rangle_z$
ruxmxy	$\langle \rho u_x \rangle_z$
ruymxy	$\langle \rho u_y \rangle_z$
ruzmxy	$\langle \rho u_z \rangle_z$
ux2mxy	$\langle u_x^2 \rangle_z$
uy2mxy	$\left\langle u_y^2 \right\rangle_z$
uz2mxy	$\langle u_z^2 \rangle_z$
rux2mxy	$\langle \rho u_x^2 \rangle_z$
ruy2mxy	$\left\langle \rho u_y^2 \right\rangle_z$
ruz2mxy	$\langle \rho u_z^2 \rangle_z$
ruxuymxy	$\langle \rho u_x u_y \rangle_z$
ruxuzmxy	$\langle \rho u_x u_z \rangle_z$
ruyuzmxy	$\langle \rho u_y u_z \rangle_z$
fkinxmxy	$\left\langle \frac{1}{2} \varrho \boldsymbol{u}^2 u_x \right\rangle_z$
fkinymxy	$\left\langle \frac{1}{2} \varrho \boldsymbol{u}^2 u_y \right\rangle_z$
Module 'density.f90'	
rhomxy	$\langle \varrho \rangle_z$
Module 'entropy.f90'	
TTmxy	$\langle T \rangle_z$
ssmxy	$\langle s \rangle_z$
uxTTmxy	$\langle u_x T \rangle_z$
uyTTmxy	$\langle u_y T \rangle_z$
uzTTmxy	$\langle u_z T \rangle_z$
gTxmxy	$\langle \nabla_x T \rangle_z$

gTymxy	$\langle\nabla_y T\rangle_z$
gTzmxy	$\langle\nabla_z T\rangle_z$
gsxmxy	$\langle\nabla_x s\rangle_z$
gsymxy	$\langle\nabla_y s\rangle_z$
gszmxy	$\langle\nabla_z s\rangle_z$
gTxgsxmxy	$\langle(\nabla T\times\nabla s)_x\rangle_z$
gTxgsymxy	$\left\langle(\nabla T\times\nabla s)_y\right\rangle_z$
gTxgszmxy	$\langle(\nabla T\times\nabla s)_z\rangle_z$
gTxgsx2mxy	$\langle(\nabla T\times\nabla s)_x^2\rangle_z$
gTxgsy2mxy	$\left\langle(\nabla T\times\nabla s)_y^2\right\rangle_z$
gTxgsz2mxy	$\langle(\nabla T\times\nabla s)_z^2\rangle_z$
fconvxy	$\langle c_p\varrho u_x T\rangle_z$
fconvyxy	$\langle c_p\varrho u_y T\rangle_z$
fconvzxy	$\langle c_p\varrho u_z T\rangle_z$
fradxy_Kprof	$F_x^{\rm rad}$ (x-component of radiative flux, z-averaged, from Kprof)
fradymxy_Kprof	$F_y^{\rm rad}$ (y-component of radiative flux, z-averaged, from Kprof)
fradxy_kramers	$F_{\rm rad}$ (z-averaged, from Kramers' opacity)
fturbxy	$\langle\varrho T\chi_t\nabla_x s\rangle_z$
fturbymxy	$\langle\varrho T\chi_t\nabla_y s\rangle_z$
fturbrxy	$\langle\varrho T\chi_{ri}\nabla_i s\rangle_z$ (radial part of anisotropic turbulent heat flux)
fturbthxy	$\langle\varrho T\chi_{\theta i}\nabla_i s\rangle_z$ (latitudinal part of anisotropic turbulent heat flux)
dcoolxy	surface cooling flux
Module 'magnetic.f90'	
bxmxy	$\langle B_x\rangle_z$
bymxy	$\langle B_y\rangle_z$
bzmxy	$\langle B_z\rangle_z$
jxmxy	$\langle J_x\rangle_z$
jymxy	$\langle J_y\rangle_z$
jzmxy	$\langle J_z\rangle_z$
axmxy	$\langle A_x\rangle_z$
aymxy	$\langle A_y\rangle_z$
azmxy	$\langle A_z\rangle_z$
bx2mxy	$\langle B_x^2\rangle_z$
by2mxy	$\langle B_y^2\rangle_z$
bz2mxy	$\langle B_z^2\rangle_z$
bxbymxy	$\langle B_xB_y\rangle_z$
bxbzmxy	$\langle B_xB_z\rangle_z$
bybzmxy	$\langle B_yB_z\rangle_z$

poynxmxy	$\langle \boldsymbol{E} \times \boldsymbol{B} \rangle_x$
poynymxy	$\langle \boldsymbol{E} \times \boldsymbol{B} \rangle_y$
poynzmxy	$\langle \boldsymbol{E} \times \boldsymbol{B} \rangle_z$
jbmxy	$\langle \boldsymbol{J} \cdot \boldsymbol{B} \rangle_z$
abmxy	$\langle \boldsymbol{A} \cdot \boldsymbol{B} \rangle_z$
examxy1	$\langle \boldsymbol{E} \times \boldsymbol{A} \rangle_z \|_x$
examxy2	$\langle \boldsymbol{E} \times \boldsymbol{A} \rangle_z \|_y$
examxy3	$\langle \boldsymbol{E} \times \boldsymbol{A} \rangle_z \|_z$
StokesImxy	$\langle \epsilon_{B\perp} \rangle_z \|_z$
StokesQmxy	$- \langle \epsilon_{B\perp} \cos 2\chi \rangle_z \|_z$
StokesUmxy	$- \langle \epsilon_{B\perp} \sin 2\chi \rangle_z \|_z$
StokesQ1mxy	$+ \langle F\epsilon_{B\perp} \sin 2\chi \rangle_z \|_z$
StokesU1mxy	$- \langle F\epsilon_{B\perp} \cos 2\chi \rangle_z \|_z$
beta1mxy	$\left\langle \boldsymbol{B}^2/(2\mu_0 p) \right\rangle_z \|_z$
Module 'density_stratified.f90'	
drhomxy	$\langle \Delta\rho/\rho_0 \rangle_z$
drho2mxy	$\langle (\Delta\rho/\rho_0)^2 \rangle_z$
Module 'gravity_simple.f90'	
epotmxy	$\langle \varrho\Phi_{\rm grav} \rangle_z$
epotuxmxy	$\langle \varrho\Phi_{\rm grav} u_x \rangle_z$ (potential energy flux)
Module 'magnetic_shearboxJ.f90'	
bxmxy	$\langle B_x \rangle_z$
bymxy	$\langle B_y \rangle_z$
bzmxy	$\langle B_z \rangle_z$
jxmxy	$\langle J_x \rangle_z$
jymxy	$\langle J_y \rangle_z$
jzmxy	$\langle J_z \rangle_z$
axmxy	$\langle A_x \rangle_z$
aymxy	$\langle A_y \rangle_z$
azmxy	$\langle A_z \rangle_z$
bx2mxy	$\langle B_x^2 \rangle_z$
by2mxy	$\langle B_y^2 \rangle_z$
bz2mxy	$\langle B_z^2 \rangle_z$
bxbymxy	$\langle B_x B_y \rangle_z$
bxbzmxy	$\langle B_x B_z \rangle_z$
bybzmxy	$\langle B_y B_z \rangle_z$
poynxmxy	$\langle \boldsymbol{E} \times \boldsymbol{B} \rangle_x$

poynymxy	$\langle \boldsymbol{E} \times \boldsymbol{B} \rangle_y$	
poynzmxy	$\langle \boldsymbol{E} \times \boldsymbol{B} \rangle_z$	
jbmxy	$\langle \boldsymbol{J} \cdot \boldsymbol{B} \rangle_z$	
abmxy	$\langle \boldsymbol{A} \cdot \boldsymbol{B} \rangle_z$	
examxy1	$\langle \boldsymbol{E} \times \boldsymbol{A} \rangle_z \|_x$	
examxy2	$\langle \boldsymbol{E} \times \boldsymbol{A} \rangle_z \|_y$	
examxy3	$\langle \boldsymbol{E} \times \boldsymbol{A} \rangle_z \|_z$	
StokesImxy	$\langle \epsilon_{B\perp} \rangle_z \|_z$	
StokesQmxy	$- \langle \epsilon_{B\perp} \cos 2\chi \rangle_z \|_z$	
StokesUmxy	$- \langle \epsilon_{B\perp} \sin 2\chi \rangle_z \|_z$	
StokesQ1mxy	$+ \langle F\epsilon_{B\perp} \sin 2\chi \rangle_z \|_z$	
StokesU1mxy	$- \langle F\epsilon_{B\perp} \cos 2\chi \rangle_z \|_z$	
beta1mxy	$\left\langle \boldsymbol{B}^2/(2\mu_0 p) \right\rangle_z \|_z$	
Module 'temperature_idealgas.f90'		
TTmxy	$\langle T \rangle_z$	
Emzmxy	$\langle Em_z \rangle_z$	Emission in z-direction
Module 'thermal_energy.f90'		
TTmxy	$\langle T \rangle_z$	
Module 'viscosity.f90'		
fviscmxy	$\langle 2\nu\varrho u_i \mathcal{S}_{ix} \rangle_z$ (x-xomponent of viscous flux)	
fviscsmmxy	$\langle 2\nu_{\rm Smag}\varrho u_i \mathcal{S}_{ix} \rangle_z$ (x-xomponent of viscous flux)	
fviscymxy	$\langle 2\nu\varrho u_i \mathcal{S}_{iy} \rangle_z$ (y-xomponent of viscous flux)	

1.11 Boundary conditions

The following tables list all possible boundary condition labels that are documented.

1.11.1 Boundary condition bcx

Variable	Meaning
Module 'boundcond.f90'	
0	zero value in ghost zones, free value on boundary
p	periodic
s	symmetry, $f_{N+i} = f_{N-i}$; implies $f'(x_N) = f'''(x_0) = 0$
sf	symmetry with respect to interface

ss	symmetry, plus function value given
s0d	symmetry, function value such that df/dx=0
a	antisymmetry, $f_{N+i} = -f_{N-i}$; implies $f(x_N) = f''(x_0) = 0$
af	antisymmetry with respect to interface
a2	antisymmetry relative to boundary value, $f_{N+i} = 2f_N - f_{N-i}$; implies $f''(x_0) = 0$
a2v	set boundary value and antisymmetry relative to it $f_{N+i} = 2f_N - f_{N-i}$; implies $f''(x_0) = 0$
a2r	sets $d^2f/dr^2 + 2df/dr - 2f/r^2 = 0$ This is the replacement of zero second derivative in spherical coordinates, in radial direction.
cpc	cylindrical perfect conductor implies $f'' + f'/R = 0$
cpp	cylindrical perfect conductor implies $f'' + f'/R = 0$
cpz	cylindrical perfect conductor implies $f'' + f'/R = 0$
spr	spherical perfect conductor implies $f'' + 2f'/R = 0$ and $f(x_N) = 0$
v	vanishing third derivative
cop	copy value of last physical point to all ghost cells
1s	onesided
d1s	onesided for 1st/2nd derivative in two first inner points, Dirichlet in boundary point
n1s	onesided for 1st/2nd derivative in two first inner points, Neumann in boundary point
1so	onesided
cT	constant temperature (implemented as condition for entropy s or temperature T)
c1	constant temperature (or maybe rather constant conductive flux??)
Fgs	Fconv = - chi_t*rho*T*grad(s)
Fct	Fbot = - K*grad(T) - chi_t*rho*T*grad(s)
Fcm	$Fbot = -K * grad(\overline{T})\ -chi_t * \overline{rho} * \overline{T} * grad(\overline{s})$
sT	symmetric temperature, $T_{N-i} = T_{N+i}$; implies $T'(x_N) = T'''(x_0) = 0$
asT	select entropy for uniform ghost temperature matching fluctuating boundary value, $T_{N-i} = T_N =$; implies $T'(x_N) = T'(x_0) = 0$
f	“freeze” value, i.e. maintain initial
fg	“freeze” value, i.e. maintain initial
1	$f = 1$ (for debugging)
set	set boundary value to fbcx
der	set derivative on boundary to fbcx
slo	set slope at the boundary = fbcx
slp	set slope at the boundary and in ghost cells = fbcx
shx	set shearing boundary proportional to x with slope=fbcx and abscissa=fbcx2

shy	set shearing boundary proportional to y with slope=fbcx and abscissa=fbcx2
shz	set shearing boundary proportional to z with slope=fbcx and abscissa=fbcx2
dr0	set boundary value [really??]
ovr	overshoot boundary condition ie $(d/dx - 1/\mathrm{dist})f = 0$.
out	allow outflow, but no inflow forces ghost cells and boundary to not point inwards
e1o	allow outflow, but no inflow uses the e1 extrapolation scheme
ant	stops and prompts for adding documentation
e1	extrapolation [describe]
e2	extrapolation [describe]
e3	extrapolation in log [maintain a power law]
el	linear extrapolation from last two active cells
hat	top hat jet profile in spherical coordinate.
jet	top hat jet profile in cartezian coordinate.
spd	sets $d(rA_\alpha)/dr$ = fbcx(j)
sfr	stress-free boundary condition for spherical coordinate system.
sr1	Stress-free bc for spherical coordinate system. Implementation with one-sided derivative.
nfr	Normal-field bc for spherical coordinate system. Some people call this the "(angry) hedgehog bc".
nr1	Normal-field bc for spherical coordinate system. Some people call this the "(angry) hedgehog bc". Implementation with one-sided derivative.
sa2	$(d/dr)(rB_\phi) = 0$ imposes boundary condition on 2nd derivative of rA_ϕ. Same applies to θ component.
pfc	perfect-conductor in spherical coordinate: $d/dr(A_r) + 2/r = 0$.
fix	set boundary value [really??]
fil	set boundary value from a file
cfb	radial centrifugal balance
g	set to given value(s) or function
nil	do nothing; assume that everything is set
ioc	inlet/outlet on western/eastern hemisphere in cylindrical coordinates do nothing; assume that everything is set
s	implies $f'(y_N) = f'''(y_0) = 0$

Module 'boundcond_alt.f90'

0	zero value in ghost zones, free value on boundary
p	periodic
s	symmetry, $f_{N+i} = f_{N-i}$; implies $f'(x_N) = f'''(x_0) = 0$
ss	symmetry, plus function value given

s0d	symmetry, function value such that df/dx=0
a	antisymmetry, $f_{N+i} = -f_{N-i}$; implies $f(x_N) = f''(x_0) = 0$
a2	antisymmetry relative to boundary value, $f_{N+i} = 2f_N - f_{N-i}$; implies $f''(x_0) = 0$
a2r	sets $d^2f/dr^2 + 2df/dr - 2f/r^2 = 0$ This is the replacement of zero second derivative in spherical coordinates, in radial direction.
cpc	cylindrical perfect conductor implies $f'' + f'/R = 0$
cpp	cylindrical perfect conductor implies $f'' + f'/R = 0$
cpz	cylindrical perfect conductor implies $f'' + f'/R = 0$
spr	spherical perfect conductor implies $f'' + 2f'/R = 0$ and $f(x_N) = 0$
v	vanishing third derivative
cop	copy value of last physical point to all ghost cells
1s	onesided
1so	onesided
cT	constant temperature (implemented as condition for entropy s or temperature T)
c1	constant temperature (or maybe rather constant conductive flux??)
Fgs	Fconv = - chi_t*rho*T*grad(s)
Fct	Fbot = - K*grad(T) - chi_t*rho*T*grad(s)
Fcm	$Fbot = -K * grad(\overline{T})\ -chi_t * \overline{rho} * \overline{T} * grad(\overline{s})$
sT	symmetric temperature, $T_{N-i} = T_{N+i}$; implies $T'(x_N) = T'''(x_0) = 0$
asT	select entropy for uniform ghost temperature matching fluctuating boundary value, $T_{N-i} = T_N =$; implies $T'(x_N) = T'(x_0) = 0$
f	"freeze" value, i.e. maintain initial
fg	"freeze" value, i.e. maintain initial
1	$f = 1$ (for debugging)
set	set boundary value to fbcx12
der	set derivative on boundary to fbcx12
slo	set slope at the boundary = fbcx12
dr0	set boundary value [really??]
ovr	overshoot boundary condition ie $(d/dx - 1/\mathrm{dist})f = 0$.
out	allow outflow, but no inflow forces ghost cells and boundary to not point inwards
e1o	allow outflow, but no inflow uses the e1 extrapolation scheme
ant	stops and prompts for adding documentation
e1	extrapolation [describe]
e2	extrapolation [describe]
e3	extrapolation in log [maintain a power law]
hat	top hat jet profile in spherical coordinate.

jet	top hat jet profile in cartezian coordinate.
spd	sets $d(rA_\alpha)/dr = $ fbcx12(j)
sfr	stress-free boundary condition for spherical coordinate system.
nfr	Normal-field bc for spherical coordinate system. Some people call this the "(angry) hedgehog bc".
sa2	$(d/dr)(rB_\phi) = 0$ imposes boundary condition on 2nd derivative of rA_ϕ. Same applies to θ component.
pfc	perfect-conductor in spherical coordinate: $d/dr(A_r) + 2/r = 0$.
fix	set boundary value [really??]
fil	set boundary value from a file
g	set to given value(s) or function
nil	do nothing; assume that everything is set
ioc	inlet/outlet on western/eastern hemisphere in cylindrical coordinates
	do nothing; assume that everything is set
s	implies $f'(y_N) = f'''(y_0) = 0$

1.11.2 Boundary condition bcy

Variable	Meaning
	Module 'boundcond.f90'
sds	symmetric-derivative-set
0	zero value in ghost zones, free value on boundary
p	periodic
pp	periodic across the pole
yy	Yin-Yang grid
ap	anti-periodic across the pole
s	symmetry symmetry, $f_{N+i} = f_{N-i}$;
ss	symmetry, plus function value given
sds	symmetric-derivative-set
cds	complex symmetric-derivative-set
s0d	symmetry, function value such that df/dy=0
a	antisymmetry
a2	antisymmetry relative to boundary value
v	vanishing third derivative
v3	vanishing third derivative
out	allow outflow, but no inflow forces ghost cells and boundary to not point inwards
1s	onesided

d1s	onesided for 1st and 2nd derivative in two first inner points, Dirichlet in boundary point
n1s	onesided for 1st and 2nd derivative in two first inner points, Neumann in boundary point
cT	constant temp.
sT	symmetric temp.
asT	select entropy for uniform ghost temperature matching fluctuating boundary value, $T_{N-i} = T_N =$; implies $T'(x_N) = T'(x_0) = 0$
f	freeze value
s+f	freeze value
fg	"freeze" value, i.e. maintain initial
fBs	frozen-in B-field (s)
fB	frozen-in B-field (a2)
1	f=1 (for debugging)
set	set boundary value
sse	symmetry, set boundary value
sep	set boundary value
e1	extrapolation
e2	extrapolation
e3	extrapolation in log [maintain a power law]
der	set derivative on the boundary
cop	outflow: copy value of last physical point to all ghost cells
c+k	no-inflow: copy value of last physical point to all ghost cells, but suppressing any inflow
sfr	stress-free boundary condition for spherical coordinate system.
nfr	Normal-field bc for spherical coordinate system. Some people call this the "(angry) hedgehog bc".
spt	spherical perfect conducting boundary condition along θ boundary $f'' + \cot\theta f' = 0$ and $f(x_N) = 0$
pfc	perfect conducting boundary condition along θ boundary
nil','	do nothing; assume that everything is set
sep	set boundary value
crk	no-inflow: copy value of last physical point to all ghost cells, but suppressing any inflow

Module 'boundcond_alt.f90'

sds	symmetric-derivative-set
0	zero value in ghost zones, free value on boundary
p	periodic

pp	periodic across the pole
ap	anti-periodic across the pole
s	symmetry symmetry, $f_{N+i} = f_{N-i}$;
ss	symmetry, plus function value given
sds	symmetric-derivative-set
cds	complex symmetric-derivative-set
s0d	symmetry, function value such that df/dy=0
a	antisymmetry
a2	antisymmetry relative to boundary value
v	vanishing third derivative
v3	vanishing third derivative
out	allow outflow, but no inflow forces ghost cells and boundary to not point inwards
1s	onesided
cT	constant temp.
sT	symmetric temp.
asT	select entropy for uniform ghost temperature matching fluctuating boundary value, $T_{N-i} = T_N =$; implies $T'(x_N) = T'(x_0) = 0$
f	freeze value
s+f	freeze value
fg	"freeze" value, i.e. maintain initial
1	f=1 (for debugging)
set	set boundary value
sse	symmetry, set boundary value
sep	set boundary value
e1	extrapolation
e2	extrapolation
e3	extrapolation in log [maintain a power law]
der	set derivative on the boundary
cop	outflow: copy value of last physical point to all ghost cells
c+k	no-inflow: copy value of last physical point to all ghost cells, but suppressing any inflow
sfr	stress-free boundary condition for spherical coordinate system.
nfr	Normal-field bc for spherical coordinate system. Some people call this the "(angry) hedgehog bc".
spt	spherical perfect conducting boundary condition along θ boundary $f'' + \cot\theta f' = 0$ and $f(x_N) = 0$
pfc	perfect conducting boundary condition along θ boundary
nil','	do nothing; assume that everything is set

sep	set boundary value

1.11.3 Boundary condition bcz

Variable	Meaning
	Module 'boundcond.f90'
0	zero value in ghost zones, free value on boundary
p	periodic
yy	Yin-Yang grid
s	symmetry
sf	symmetry with respect to interface
s0d	symmetry, function value such that df/dz=0
0ds	symmetry, function value such that df/dz=0
a	antisymmetry
a2	antisymmetry relative to boundary value
a2v	set boundary value and antisymmetry relative to it
af	antisymmetry with respect to interface
a0d	antisymmetry with zero derivative
v	vanishing third derivative
v3	vanishing third derivative
1s	one-sided
d1s	onesided for 1st and 2nd derivative in two first inner points, Dirichlet in boundary point
n1s	onesided for 1st and 2nd derivative in two first inner points, Neumann in boundary point
a1s	special for perfect conductor with const alpha and etaT when A considered as B; one-sided for 1st and 2nd derivative in two first inner points
fg	"freeze" value, i.e. maintain initial
c1	complex
c1s	complex
Fgs	Fconv = - chi_t*rho*T*grad(s)
Fct	Fbot = - K*grad(T) - chi_t*rho*T*grad(s)
c3	constant flux at the bottom with a variable hcond
pfe	potential field extrapolation
p1D	potential field extrapolation in 1D
pot	potential magnetic field
pwd	a variant of 'pot' for nprocx=1
hds	hydrostatic equilibrium with a high-frequency filter

cT	constant temp.
cT1	constant temp.
cT2	constant temp. (keep lnrho)
cT3	constant temp. (keep lnrho)
hs	hydrostatic equilibrium
hse	hydrostatic extrapolation rho or lnrho is extrapolated linearily and the temperature is calculated in hydrostatic equilibrium.
cp	constant pressure
sT	symmetric temp.
ctz	for interstellar runs copy T
cdz	for interstellar runs limit rho
ism	for interstellar runs limit rho
asT	select entropy for uniform ghost temperature matching fluctuating boundary value, $T_{N-i} = T_N =$; implies $T'(x_N) = T'(x_0) = 0$
c2	complex
db	complex
ce	complex
e1	extrapolation
e2	extrapolation
ex	simple linear extrapolation in first order
exf	simple linear extrapolation in first order
exd	simple linear extrapolation in first order
exm	simple linear extrapolation in first order
b1	extrapolation with zero value (improved 'a')
b2	extrapolation with zero value (improved 'a')
b3	extrapolation with zero value (improved 'a')
f','fa	freeze value + antisymmetry
fs	freeze value + symmetry
fBs	frozen-in B-field (s)
fB	frozen-in B-field (a2)
g	set to given value(s) or function
1	f=1 (for debugging)
StS	solar surface boundary conditions
set	set boundary value
der	set derivative on the boundary
div	set the divergence of $\boldsymbol{u}$ to a given value use bc = 'div' for iuz
ovr	set boundary value
inf	allow inflow, but no outflow
ouf	allow outflow, but no inflow

in	allow inflow, but no outflow forces ghost cells and boundary to not point outwards
out	allow outflow, but no inflow forces ghost cells and boundary to not point inwards
in0	allow inflow, but no outflow forces ghost cells and boundary to not point outwards relaxes to vanishing 1st derivative at boundary
ou0	allow outflow, but no inflow forces ghost cells and boundary to not point inwards relaxes to vanishing 1st derivative at boundary
ind	allow inflow, but no outflow forces ghost cells and boundary to not point outwards creates inwards pointing or zero 1st derivative at boundary
oud	allow outflow, but no inflow forces ghost cells and boundary to not point inwards creates outwards pointing or zero 1st derivative at boundary
ubs	copy boundary outflow,
win	forces massflux given as $\Sigma\rho_i(u_i + u_0) = \mathrm{fbcz1/2}(\rho)$
cop	copy value of last physical point to all ghost cells
nil	do nothing; assume that everything is set

Module 'boundcond_alt.f90'	
cfb	radial centrifugal balance
fBs	frozen-in B-field (s)
fB	frozen-in B-field (a2)
0	zero value in ghost zones, free value on boundary
p	periodic
s	symmetry
sf	symmetry with respect to interface
s0d	symmetry, function value such that df/dz=0
0ds	symmetry, function value such that df/dz=0
a	antisymmetry
a2	antisymmetry relative to boundary value
af	antisymmetry with respect to interface
a0d	antisymmetry with zero derivative
v	vanishing third derivative
v3	vanishing third derivative
1s	one-sided
fg	"freeze" value, i.e. maintain initial
c1	complex
Fgs	Fconv = - chi_t*rho*T*grad(s)
Fct	Fbot = - K*grad(T) - chi_t*rho*T*grad(s)
c3	constant flux at the bottom with a variable hcond

pfe	potential field extrapolation
p1D	potential field extrapolation in 1D
pot	potential magnetic field
pwd	a variant of 'pot' for nprocx=1
hds	hydrostatic equilibrium with a high-frequency filter
cT	constant temp.
cT2	constant temp. (keep lnrho)
cT3	constant temp. (keep lnrho)
hs	hydrostatic equilibrium
hse	hydrostatic extrapolation rho or lnrho is extrapolated linearily and the temperature is calculated in hydrostatic equilibrium.
cp	constant pressure
sT	symmetric temp.
ctz	for interstellar runs copy T
cdz	for interstellar runs limit rho
asT	select entropy for uniform ghost temperature matching fluctuating boundary value, $T_{N-i} = T_N =$; implies $T'(x_N) = T'(x_0) = 0$
c2	complex
db	complex
ce	complex
e1	extrapolation
e2	extrapolation
ex	simple linear extrapolation in first order
exf	simple linear extrapolation in first order
exd	simple linear extrapolation in first order
exm	simple linear extrapolation in first order
b1	extrapolation with zero value (improved 'a')
b2	extrapolation with zero value (improved 'a')
b3	extrapolation with zero value (improved 'a')
f','fa	freeze value + antisymmetry
fs	freeze value + symmetry
fBs	frozen-in B-field (s)
fB	frozen-in B-field (a2)
g	set to given value(s) or function
1	f=1 (for debugging)
StS	solar surface boundary conditions
set	set boundary value
der	set derivative on the boundary
div	set the divergence of $\boldsymbol{u}$ to a given value use bc = 'div' for iuz

ovr	set boundary value
inf	allow inflow, but no outflow
ouf	allow outflow, but no inflow
in	allow inflow, but no outflow forces ghost cells and boundary to not point outwards
out	allow outflow, but no inflow forces ghost cells and boundary to not point inwards
in0	allow inflow, but no outflow forces ghost cells and boundary to not point outwards relaxes to vanishing 1st derivative at boundary
ou0	allow outflow, but no inflow forces ghost cells and boundary to not point inwards relaxes to vanishing 1st derivative at boundary
ind	allow inflow, but no outflow forces ghost cells and boundary to not point outwards creates inwards pointing or zero 1st derivative at boundary
oud	allow outflow, but no inflow forces ghost cells and boundary to not point inwards creates outwards pointing or zero 1st derivative at boundary
ubs	copy boundary outflow,
win	forces massflux given as $\Sigma\rho_i(u_i + u_0) = \text{fbcz1}/2(\rho)$
cop	copy value of last physical point to all ghost cells
nil	do nothing; assume that everything is set

1.12 Initial condition parameter dependence

The following tables list which parameters from each Namelist are required (•), optional (⋄) or irrelevant (blank). The distinction is made between required and optional where by a parameter requires a setting if the default value would give an invalid or degenerate case for the initial condition.

inituu	ampluu	widthuu	urand	uu_left	uu_right	uu_upper	uu_lower	uy_left	uy_right	kx_uu	ky_uu	kz_uu
zero												
gaussian-noise	•											
gaussian-noise-x	•											
xjump		◇		•	•			•	•			
Beltrami-x	•											
Beltrami-y	•											
Beltrami-z	•											
trilinear-x	•											
trilinear-y	•											
trilinear-z	•											
cos-cos-sin-uz	•											
tor_pert	•											
trilinear-x	•											
sound-wave	•									•		
shock-tube		◇		•	•							
bullets	•	◇										
Alfven-circ-x	•									◇		
const-ux	•											
const-uy	•											
tang-discont-z	◇	•				•	•					
Fourier-trunc	•	◇								•	•	
up-down	•	◇										

initss	ampl_ss	radius_ss	widthss	epsilon_ss	grads0	pertss	ss_left	ss_right	ss_const	mpoly0	mpoly1	mpoly2	isothtop	khor_ss	center1_x	center1_y	center1_z	center2_x	center2_y	center2_z	thermal_background
zero																					
const_ss									•												
blob	•	•																			
isothermal																					
Ferrière																					
xjump			•				•	•													
hor-fluxtube	•	•		•																	
hor-tube	•	•		•																	
sedov		•													•	•	•				•
sedov-dual		•													•	•	•	•	•	•	•
isobaric																					
isentropic																					
linprof																					
piecew-poly																					
polytropic																					