CCP two layers (128 cubed)


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#------------------------------------------------#
('Datafile with space-time averages: ', 'DATA/TSERIES/tseries_ccptwo_128cubed_long.npy')
('Central time (in s): ', 409.4)
('Averaging windows (in s): ', 300.0)
('Time range (in s from-to): ', 150.0, 568.0)
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Resolution: 128 128 128
Radial size of computational domain (in cm): 4.03e+08 1.20e+09
Radial size of convection zone (in cm):  4.16e+08 8.53e+08
Extent of convection zone (in Hp): 2.345610
Averaging time window (in s): 300.000000
RMS velocities in convection zone (in cm/s):  1.20e+07
Convective turnover timescale (in s)  7.28e+01
P_turb o P_gas 6.45e-04
Dissipation length scale (in cm): 1.42e+09
Total nuclear luminosity (in erg/s): 1.08e+45
Rate of TKE dissipation (in erg/s): 5.47e+44
Dissipation timescale for TKE (in s): 58.993843
Reynolds number: 288
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Gravitational Acceleration

$\overline{g_x}$

$\overline{g}_x$ (cm s^{-2})

x (10^8 cm)

Heating (source term)

$\overline{\varepsilon_{nuc}}$

$\log \overline{\varepsilon_{enuc}}$ (erg g^{-1} s^{-1})

x (10^8 cm)

velocities

u_{turb}

velocity (cm s^{-1})

x (cm)

Brunt-Vaisalla frequency

N^2

N^2

x (cm)

buoyancy

b

b (s^{-2} cm)

x (cm)

relative rms fluctuations

$q'_{rms}/\overline{q}$

ρ
T
P
M_s (Mach)
$M_s^2 = u_r^2/c_s^2$

x (cm)

Xflux for fluid1

$\overline{\rho X''_i u''_r}$ (g cm^{-2} s^{-1})

x (10^8 cm)

f

Xflux X equation for fluid2

g cm^{-2} s^{-2}

x (10^8 cm)

$-\partial_t f_i$
$-\nabla_x(\widetilde{u}_x f)$
$-\nabla_x f_i^x$
$-f_i \partial_x \widetilde{u}_x$
$-R_{xx}\partial_x \widetilde{X}$
$-\overline{X''\partial_x \overline{P}} - \overline{X''\partial_x P'}$
$+\overline{u''_x \rho X}$
res

Xvariance equation for fluid1

g cm^{-3} s^{-1}

x (10^8 cm)

$-\partial_t(\overline{\rho}\sigma)$
$-\nabla_x(\overline{\rho}\widetilde{u}_x\sigma)$
$-\nabla_x f^\sigma$
$-2f_i\partial_x\widetilde{X}$
$+2\overline{\rho X X}$
$-\overline{\rho}\sigma/\tau_L$
res

Xflux for fluid2

$\overline{\rho X''_i u''_r}$ (g cm^{-2} s^{-1})

x (10^8 cm)

f

Xflux X equation for fluid1

g cm^{-2} s^{-2}

x (10^8 cm)

$-\partial_t f_i$
$-\nabla_x(\widetilde{u}_x f)$
$-\nabla_x f_i^x$
$-f_i \partial_x \widetilde{u}_x$
$-R_{xx}\partial_x \widetilde{X}$
$-\overline{X''\partial_x \overline{P}} - \overline{X''\partial_x P'}$
$+\overline{u''_x \rho X}$
res

Xvariance equation for fluid2

g cm^{-3} s^{-1}

x (10^8 cm)

$-\partial_t(\overline{\rho}\sigma)$
$-\nabla_x(\overline{\rho}\widetilde{u}_x\sigma)$
$-\nabla_x f^\sigma$
$-2f_i\partial_x\widetilde{X}$
$+2\overline{\rho X X}$
$-\overline{\rho}\sigma/\tau_L$
res