Oxygen Burning Shell 512x128x128 – 14 elements network

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In [1]: run ransX.py
#------------------------------------------------------#
('Datafile with space-time averages: ', 'D:\\ransX\\DATA_D\\TSERIES\\tseries_oburn14_512x128x128_cosma_1400secs.npy')
('Central time (in s): ', 2221.2)
('Averaging windows (in s): ', 1400.0)
('Time range (in s from-to): ', 1500.0, 2940.0)
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Resolution: 512 128 128
Radial size of computational domain (in cm): 3.00e+08 1.00e+09
Radial size of convection zone (in cm):  4.20e+08 9.50e+08
Extent of convection zone (in Hp): 2.286610
Overshooting at inner/outer convection boundary (in Hp):  0.12 0.57
Averaging time window (in s): 1400.000000
RMS velocities in convection zone (in cm/s):  1.09e+07
Convective turnover timescale (in s)  9.74e+01
P_turb o P_gas 3.98e-04
Mach number Max 2.03e-02
Mach number Mean 1.63e-02
Dissipation length scale (in cm): 9.23e+08
Total nuclear luminosity (in erg/s): 2.73e+46
Rate of TKE dissipation (in erg/s): 3.00e+45
Dissipation timescale for TKE (in s): 42.358416
Dissipation timescale for TKE vertical (in s): 117.879839
Dissipation timescale for TKE horizontal (in s): nan
Reynolds number: 2438
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rhoX transport for neut (netw: 14 ele) 3D

Legend:
- $-\partial_t(\overline{\rho}\widetilde{X})$
- $-\nabla_r(\overline{\rho}\widetilde{X}\widetilde{u}_r)$
- $-\nabla_r f$
- $+\overline{\rho}\widetilde{X}^{\mathrm{nuc}}$
- res

Axes: $\mathrm{g\,cm^{-3}\,s^{-1}}$ vs $r\ \mathrm{(cm)}$

rhoX transport budget for neut

Axis: $\mathrm{g\,s^{-1}}$

Categories: $-\partial_t(\overline{\rho}\widetilde{X})$, $-\nabla_r(\overline{\rho}\widetilde{X}\widetilde{u}_r)$, $-\nabla_r f$, $+\overline{\rho}\widetilde{X}^{\mathrm{nuc}}$, res

timescales for neut

Axis: $\tau(s)$ vs $r\ \mathrm{(cm)}$

Legend:
- $|\tau^i_{trans}|$
- $|\tau^i_{nuc}|$
- $|\tau^i_{\rho X}|$
- 1-neut-prot-
- τ_{conv}

rhoX transport for prot (netw: 14 ele) 3D

Legend:
- $-\partial_t(\overline{\rho}\widetilde{X})$
- $-\nabla_r(\overline{\rho}\widetilde{X}\widetilde{u}_r)$
- $-\nabla_r f$
- $+\overline{\rho}\widetilde{X}^{\mathrm{nuc}}$
- res

Axes: $\mathrm{g\,cm^{-3}\,s^{-1}}$ vs $r\ \mathrm{(cm)}$

rhoX transport budget for prot

Axis: $\mathrm{g\,s^{-1}}$

Categories: $-\partial_t(\overline{\rho}\widetilde{X})$, $-\nabla_r(\overline{\rho}\widetilde{X}\widetilde{u}_r)$, $-\nabla_r f$, $+\overline{\rho}\widetilde{X}^{\mathrm{nuc}}$, res

timescales for prot

Axis: $\tau(s)$ vs $r\ \mathrm{(cm)}$

Legend:
- $|\tau^i_{trans}|$
- $|\tau^i_{nuc}|$
- $|\tau^i_{\rho X}|$
- 1-neut-prot-
- 1-mg24-prot-na23-cf
- 1-mg24-prot-na23-cf
- 1-s32-prot-p31-fk
- 1-cl35-prot-s34-fk
- 1-ar36-prot-cl35-fk
- 2-prot-na23-mg24-cf
- 2-prot-na23-mg24-cf
- 2-prot-p31-s32-fk
- 2-prot-s34-cl35-fk
- 2-prot-cl35-ar36-fk
- 2-c12-c12-prot-na23-c
- 2-o16-o16-prot-p31-c
- 2-he4-ne20-prot-na23-c
- 2-he4-ne20-prot-na23-c
- 2-he4-ne20-prot-na23-c
- 2-c12-ne20-prot-p31-r
- 2-prot-na23-he4-ne20-c
- 2-prot-na23-he4-ne20-c
- 2-prot-na23-he4-ne20-c
- τ_{conv}