

RAMSES test suite results

rt3504

June 4, 2023

Commit hash: [ebcb67](#)

Test run summary using 4 processor(s)

| | Test name | Run time | Total time | Status |
|----|------------------------------------|----------|------------|--------|
| 1 | hydro/barotrop | 0h0m2s | 0h0m48s | passed |
| 2 | hydro/cooling-frig | 0h0m40s | 0h1m36s | passed |
| 3 | hydro/implosion | 0h0m34s | 0h1m8s | passed |
| 4 | hydro/isothermal | 0h0m4s | 0h0m36s | passed |
| 5 | hydro/sod-tube | 0h0m0s | 0h0m31s | passed |
| 6 | mhd/imhd-tube | 0h0m2s | 0h0m35s | passed |
| 7 | mhd/orszag-tang | 0h0m51s | 0h1m28s | passed |
| 8 | rt/stromgren2d | 0h0m14s | 0h0m55s | passed |
| 9 | turb/driving | 0h0m45s | 0h1m37s | passed |
| 10 | tracer/sedov | 0h0m47s | 0h1m24s | passed |

Total run time (including compilations): 0h10m42s



Figure 1: hydro/barotrop test

Table 1: barotrop error summary

| Variable | This run | Reference | Error | Tolerance |
|------------|------------------------|------------------------|------------------------|------------------------|
| boxlen | 1.0000000000000000e+00 | 1.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| density | 1.6794314781800492e+03 | 1.6794314781792584e+03 | 4.7087699228366635e-13 | 2.0000000000000000e-12 |
| dx | 1.0000000000000000e+00 | 1.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| level | 8.3320000000000000e+03 | 8.3320000000000000e+03 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| ncells | 7.8400000000000000e+02 | 7.8400000000000000e+02 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| pressure | 6.0188902556779146e+02 | 6.0188902556693643e+02 | 1.4205919533071547e-12 | 2.0000000000000000e-12 |
| time | 4.9053079624299697e-04 | 4.9053079624279097e-04 | 4.1995000996896793e-13 | 2.0000000000000000e-12 |
| unit d | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| unit l | 3.0857000000000000e+18 | 3.0857000000000000e+18 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| unit t | 3.1556926000000000e+13 | 3.1556926000000000e+13 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| velocity x | 1.0539070571590826e+04 | 1.0539070571585386e+04 | 5.1623122447573017e-13 | 2.0000000000000000e-12 |
| x | 3.9200000000000000e+02 | 3.9200000000000000e+02 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| y | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| z | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |



Figure 2: hydro/cooling-frig test

Table 2: cooling-frig error summary

| Variable | This run | Reference | Error | Tolerance |
|------------|-------------------------|-------------------------|------------------------|-----------------------|
| boxlen | 5.000000000000000e+02 | 5.000000000000000e+02 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| density | -1.4250982321254784e+04 | -1.4250982321254638e+04 | 1.0211166430726244e-14 | 2.999999999999998e-13 |
| dx | 5.120000000000000e+05 | 5.120000000000000e+05 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| level | 1.638400000000000e+05 | 1.638400000000000e+05 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| ncells | 3.276800000000000e+04 | 3.276800000000000e+04 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| pressure | 1.5788229607209752e+05 | 1.5788229607209750e+05 | 1.8433878389660194e-16 | 2.999999999999998e-13 |
| time | 6.2181777872549604e-01 | 6.2181777872549504e-01 | 1.6069027878402681e-15 | 2.999999999999998e-13 |
| unit d | 2.324743400000000e-24 | 2.324743400000000e-24 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| unit l | 3.085700000000000e+18 | 3.085700000000000e+18 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| unit t | 2.539507900000000e+15 | 2.539507900000000e+15 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| velocity x | 2.0560963580686219e+07 | 2.0560963580686357e+07 | 6.7037588244437025e-15 | 2.999999999999998e-13 |
| velocity y | 1.7589792977584463e+07 | 1.7589792977584992e+07 | 3.0073760564192616e-14 | 2.999999999999998e-13 |
| velocity z | 1.4009448254150467e+07 | 1.4009448254150048e+07 | 2.9915179454181280e-14 | 2.999999999999998e-13 |
| x | 8.192000000000000e+06 | 8.192000000000000e+06 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| y | 8.192000000000000e+06 | 8.192000000000000e+06 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| z | 8.192000000000000e+06 | 8.192000000000000e+06 | 0.000000000000000e+00 | 2.999999999999998e-13 |



Figure 3: hydro/implosion test

Table 3: implosion error summary

| Variable | This run | Reference | Error | Tolerance |
|------------|-------------------------|-------------------------|------------------------|-----------------------|
| boxlen | 1.0000000000000000e+00 | 1.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| density | -3.2489384827987228e+03 | -3.2489384827987228e+03 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| dx | 9.7671875000000000e+01 | 9.7671875000000000e+01 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| level | 1.1594500000000000e+05 | 1.1594500000000000e+05 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| ncells | 1.5349000000000000e+04 | 1.5349000000000000e+04 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| pressure | -9.8425832051307543e+02 | -9.8425832051307543e+02 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| time | 5.0041662782999197e+00 | 5.0041662782999197e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| unit d | 1.0000000000000000e+00 | 1.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| unit l | 1.0000000000000000e+00 | 1.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| unit t | 1.0000000000000000e+00 | 1.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| velocity x | 8.0459072052113027e+02 | 8.0459072052113027e+02 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| velocity y | 8.0459072052125236e+02 | 8.0459072052125236e+02 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| x | 4.9655703125000000e+03 | 4.9655703125000000e+03 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| y | 4.9655703125000000e+03 | 4.9655703125000000e+03 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| z | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |



Figure 4: hydro/isothermal test

Table 4: isothermal error summary

| Variable | This run | Reference | Error | Tolerance |
|------------|------------------------|------------------------|------------------------|-----------------------|
| boxlen | 1.0000000000000000e+00 | 1.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| density | 1.6311954187712895e+03 | 1.6311954187664121e+03 | 2.9900725908250087e-12 | 4.999999999999997e-12 |
| dx | 1.0000000000000000e+00 | 1.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| level | 8.4900000000000000e+03 | 8.4900000000000000e+03 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| ncells | 7.9400000000000000e+02 | 7.9400000000000000e+02 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| pressure | 4.9146152387489883e+02 | 4.9146152387002013e+02 | 9.9269217906402560e-12 | 9.999999999999994e-12 |
| time | 4.9054716112689604e-04 | 4.9054716112737103e-04 | 9.6828400897223431e-13 | 2.000000000000000e-12 |
| unit d | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| unit l | 3.0857000000000000e+18 | 3.0857000000000000e+18 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| unit t | 3.1556926000000000e+13 | 3.1556926000000000e+13 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| velocity x | 1.0798863269643682e+04 | 1.0798863269655247e+04 | 1.0709585202597123e-12 | 2.000000000000000e-12 |
| x | 3.9700000000000000e+02 | 3.9700000000000000e+02 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| y | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| z | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |



Figure 5: hydro/sod-tube test

Table 5: sod-tube error summary

| Variable | This run | Reference | Error | Tolerance |
|------------|-------------------------|-------------------------|------------------------|-----------------------|
| boxlen | 1.0000000000000000e+00 | 1.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| density | -6.2283208883831371e+01 | -6.2283208883831371e+01 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| dx | 1.0000000000000000e+00 | 1.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| level | 1.1010000000000000e+03 | 1.1010000000000000e+03 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| ncells | 1.4200000000000000e+02 | 1.4200000000000000e+02 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| pressure | -6.8864503408245511e+01 | -6.8864503408245525e+01 | 2.0635964846731855e-16 | 2.999999999999998e-13 |
| time | 2.4504723587196500e-01 | 2.4504723587196500e-01 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| unit d | 1.0000000000000000e+00 | 1.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| unit l | 1.0000000000000000e+00 | 1.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| unit t | 1.0000000000000000e+00 | 1.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| velocity x | 8.7630269431102121e+01 | 8.7630269431102136e+01 | 1.6216833301391432e-16 | 2.999999999999998e-13 |
| x | 9.0823242187500000e+01 | 9.0823242187500000e+01 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| y | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| z | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |



Figure 6: mhd/imhd-tube test

Table 6: imhd-tube error summary

| Variable | This run | Reference | Error | Tolerance |
|------------|-------------------------|-------------------------|------------------------|-----------------------|
| B x left | 4.370000000000000e+02 | 4.370000000000000e+02 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| B x right | 4.370000000000000e+02 | 4.370000000000000e+02 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| B y left | 2.3391683489759890e+02 | 2.3391683489759890e+02 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| B y right | 2.3391683489759890e+02 | 2.3391683489759890e+02 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| B z left | 4.5872245532670718e+01 | 4.5872245532670732e+01 | 3.0979200059174945e-16 | 2.999999999999998e-13 |
| B z right | 4.5872245532670718e+01 | 4.5872245532670732e+01 | 3.0979200059174945e-16 | 2.999999999999998e-13 |
| boxlen | 3.500000000000000e+00 | 3.500000000000000e+00 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| density | -1.4066192896319757e+02 | -1.4066192896319757e+02 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| dx | 3.500000000000000e+00 | 3.500000000000000e+00 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| level | 4.906000000000000e+03 | 4.906000000000000e+03 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| ncells | 4.370000000000000e+02 | 4.370000000000000e+02 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| pressure | -1.2848475642042584e+02 | -1.2848475642042584e+02 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| time | 4.0066021201843099e-01 | 4.0066021201843099e-01 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| unit d | 1.000000000000000e+00 | 1.000000000000000e+00 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| unit l | 1.000000000000000e+00 | 1.000000000000000e+00 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| unit t | 1.000000000000000e+00 | 1.000000000000000e+00 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| velocity x | 1.9389631695548837e+02 | 1.9389631695548837e+02 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| velocity y | 4.0503914358611451e+02 | 4.0503914358611451e+02 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| velocity z | 4.4181525014765903e+01 | 4.4181525014765903e+01 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| x | 7.1933459472656250e+02 | 7.1933459472656250e+02 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| y | 0.000000000000000e+00 | 0.000000000000000e+00 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| z | 0.000000000000000e+00 | 0.000000000000000e+00 | 0.000000000000000e+00 | 2.999999999999998e-13 |



Figure 7: mhd/orszag-tang test

Table 7: orszag-tang error summary

| Variable | This run | Reference | Error | Tolerance |
|------------|-------------------------|-------------------------|------------------------|-----------------------|
| B x left | 2.2678255644469846e+04 | 2.2678255644469846e+04 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| B x right | 2.2678255644469846e+04 | 2.2678255644469846e+04 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| B y left | 2.4171115525910489e+04 | 2.4171115525910489e+04 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| B y right | 2.4171115525910489e+04 | 2.4171115525910489e+04 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| B z left | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| B z right | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| boxlen | 1.0000000000000000e+00 | 1.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| density | -6.8695267744666649e+04 | -6.8695267744666649e+04 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| dx | 2.8000000000000000e+02 | 2.8000000000000000e+02 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| level | 8.6243200000000000e+05 | 8.6243200000000000e+05 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| ncells | 1.0006600000000000e+05 | 1.0006600000000000e+05 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| pressure | -8.8280494263311819e+04 | -8.8280494263311819e+04 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| time | 5.0191436955161295e-01 | 5.0191436955161295e-01 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| unit d | 1.0000000000000000e+00 | 1.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| unit l | 1.0000000000000000e+00 | 1.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| unit t | 1.0000000000000000e+00 | 1.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| velocity x | 3.8430367312560731e+04 | 3.8430367312560731e+04 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| velocity y | 3.6141593808548649e+04 | 3.6141593808548649e+04 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| velocity z | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| x | 5.0033000000000000e+04 | 5.0033000000000000e+04 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| y | 5.0033000000000000e+04 | 5.0033000000000000e+04 | 0.0000000000000000e+00 | 2.999999999999998e-13 |
| z | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 2.999999999999998e-13 |



Figure 8: rt/stromgren2d test

Table 8: stromgren2d error summary

| Variable | This run | Reference | Error | Tolerance |
|-------------|-------------------------|-------------------------|------------------------|------------------------|
| boxlen | 1.0000000000000000e+00 | 1.0000000000000000e+00 | 0.0000000000000000e+00 | 3.0000000000000001e-06 |
| density | -1.6452782335621334e+04 | -1.6452782335617510e+04 | 2.3239326019503224e-13 | 3.0000000000000001e-06 |
| dx | 1.2800000000000000e+02 | 1.2800000000000000e+02 | 0.0000000000000000e+00 | 3.0000000000000001e-06 |
| level | 1.1468800000000000e+05 | 1.1468800000000000e+05 | 0.0000000000000000e+00 | 3.0000000000000001e-06 |
| metallicity | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 3.0000000000000001e-06 |
| ncells | 1.6384000000000000e+04 | 1.6384000000000000e+04 | 0.0000000000000000e+00 | 3.0000000000000001e-06 |
| pressure | -8.1662884923335063e+04 | -8.1662884923947786e+04 | 7.5030773549187932e-12 | 3.0000000000000001e-06 |
| scalar 01 | 4.3828664073005466e+03 | 4.3828664052645590e+03 | 4.6453333849868201e-10 | 3.0000000000000001e-06 |
| scalar 02 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 3.0000000000000001e-06 |
| scalar 03 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 3.0000000000000001e-06 |
| time | 1.5003966839451200e+01 | 1.5003966839451200e+01 | 0.0000000000000000e+00 | 3.0000000000000001e-06 |
| unit d | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 3.0000000000000001e-06 |
| unit l | 3.0900000000000000e+21 | 3.0900000000000000e+21 | 0.0000000000000000e+00 | 3.0000000000000001e-06 |
| unit t | 3.1556926000000000e+13 | 3.1556926000000000e+13 | 0.0000000000000000e+00 | 3.0000000000000001e-06 |
| velocity x | 8.7948060487332427e+00 | 8.7948060465423854e+00 | 2.4910808285962630e-10 | 3.0000000000000001e-06 |
| velocity y | 8.7948060487332409e+00 | 8.7948060465423854e+00 | 2.4910788088168276e-10 | 3.0000000000000001e-06 |
| x | 8.1920000000000000e+03 | 8.1920000000000000e+03 | 0.0000000000000000e+00 | 3.0000000000000001e-06 |
| y | 8.1920000000000000e+03 | 8.1920000000000000e+03 | 0.0000000000000000e+00 | 3.0000000000000001e-06 |
| z | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 3.0000000000000001e-06 |



Figure 9: turb/driving test

Table 9: driving error summary

| Variable | This run | Reference | Error | Tolerance |
|------------|-------------------------|-------------------------|-----------------------|-----------------------|
| boxlen | 4.000000000000000e+00 | 4.000000000000000e+00 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| density | -1.5970192503110823e+05 | -1.5970192503110823e+05 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| dx | 1.638400000000000e+04 | 1.638400000000000e+04 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| level | 1.572864000000000e+06 | 1.572864000000000e+06 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| ncells | 2.621440000000000e+05 | 2.621440000000000e+05 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| pressure | -5.3599210405342397e+05 | -5.3599210405342397e+05 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| time | 2.5147260806143501e-01 | 2.5147260806143501e-01 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| unit d | 1.5049295743500001e-20 | 1.5049295743500001e-20 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| unit l | 3.085700000000000e+18 | 3.085700000000000e+18 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| unit t | 3.155692600000000e+13 | 3.155692600000000e+13 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| velocity x | 2.2878502213449072e+05 | 2.2878502213449072e+05 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| velocity y | 2.2205591253462457e+05 | 2.2205591253462457e+05 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| velocity z | 2.1700854906616427e+05 | 2.1700854906616427e+05 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| x | 5.242880000000000e+05 | 5.242880000000000e+05 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| y | 5.242880000000000e+05 | 5.242880000000000e+05 | 0.000000000000000e+00 | 2.999999999999998e-13 |
| z | 5.242880000000000e+05 | 5.242880000000000e+05 | 0.000000000000000e+00 | 2.999999999999998e-13 |



Figure 10: tracer/sedov test

Table 10: sedov error summary

| Variable | This run | Reference | Error | Tolerance |
|------------|------------------------|------------------------|------------------------|------------------------|
| family | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 3.9999280019439422e-03 |
| levelp | 1.2500450000000000e+06 | 1.2499300000000000e+06 | 9.2005152288528153e-05 | 3.9999280019439422e-03 |
| mass | 2.5000900000000009e-01 | 2.4998600000000015e-01 | 9.2005152288287027e-05 | 3.9999280019439422e-03 |
| position x | 6.3310902343750000e+04 | 6.3286064453125000e+04 | 3.9247014077478366e-04 | 3.9999280019439422e-03 |
| position y | 6.3304500000000000e+04 | 6.3278091796875000e+04 | 4.1733564295477337e-04 | 3.9999280019439422e-03 |
| tag | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 0.0000000000000000e+00 | 3.9999280019439422e-03 |