

# RAMSES test suite

Progress since the creation  
of the SNO working group

25 November 2025  
SNO meeting

# Working group

- Goals:
  - add more tests cases
  - improve test infrastructure
- Started in January 2025
- Monthly meetings + events
  - Hackaton session @RUM (16 May)
  - Hackaton @Lyon (11- 13 June)

- Members:
  - Tine C., Benoit C., Matthias G., Pierre O.,  
Noe B., Jeremy B., Joki R., Jenny S.,  
Georges A., Romain T.

Document tabs



Meeting notes



Status

Issues

Coverage

Proposed tests

Literature & other codes

**Next meeting 01/12/2025 at 16:00**

present:

## Action items from last meetings

- (Tine) Look for more analytical tests
- (Benoit) Nener in 2D or 3D
- (Pierre) test for sf\_virial star formation recipe (similar to SF+feedback cosmo test but without FB)
- (Matthias) solver parameter study for imhd test, analogously sod-tube test
- (Joki) 1D diffusion test for IR trapping

# Activity

41 PR related to  
tests/CI merged

16 tests added,  
5 tests updated

(total 33 tests now)

Various improvements  
to the infrastructure

The screenshot shows the GitHub interface for the 'ramses-organisation' repository. The 'Pull requests' tab is selected, showing a list of 6 pull requests. The search bar contains the query 'is:pr label:"test case",CI is:closed'. The list of pull requests includes:

- [pre-commit.ci] pre-commit autoupdate** (CI) - #179 by pre-commit-ci (bot) was merged last week • Approved
- Correction of bugs in condinit\_kind='collapse'** (bug, test case) - #177 by matthiasglz was merged last week • Approved • 3 tasks done
- change slope\_type in imhd-tube and imhd-tube-nener tests** (CI, SPACE) - #169 by tinecolman was merged last week • Approved
- fix Cosmo test fails to stop when testing with restart #167** (bug, CI, test case) - #168 by nbrucy was merged on Jul 10 • Approved • 1
- Add 1D advection test** (SPACE, test case) - #166 by tinecolman was merged on Jul 9 • Approved
- Improvements to parameter sweep of sod-tube test** (CI, SPACE) - #165 by tinecolman was merged on Jul 9 • Approved
- regenerate reference solution for stellar-HII with 2 cpus** (CI, SPACE) - #160 by tinecolman was merged on Jul 1 • Approved
- Movie test** (test case) - #146 by jokirodahl was merged on Jul 2 • Approved • 3 tasks
- [tests] adjust tolerance for median error in tube tests** (CI, SPACE) - #145 by tinecolman was merged on Jun 20 • Approved

# New tests

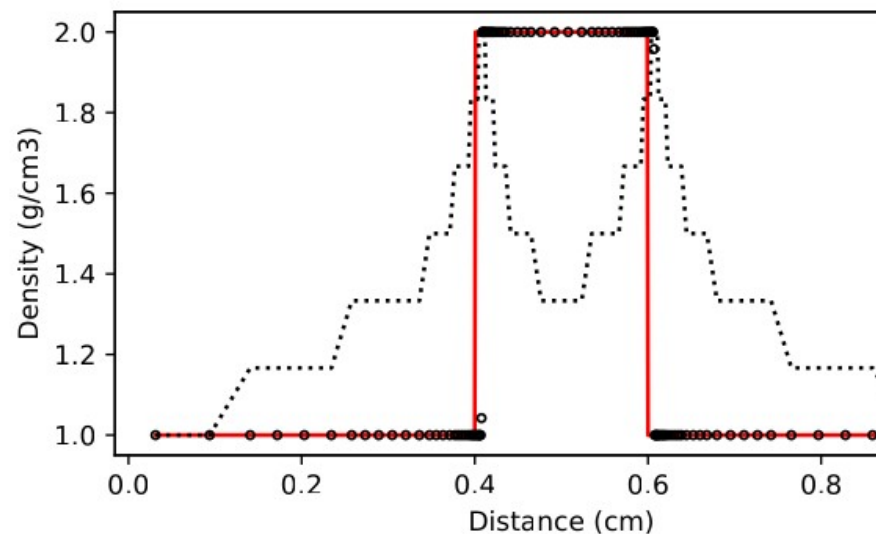


Figure 1: hydro/advection test

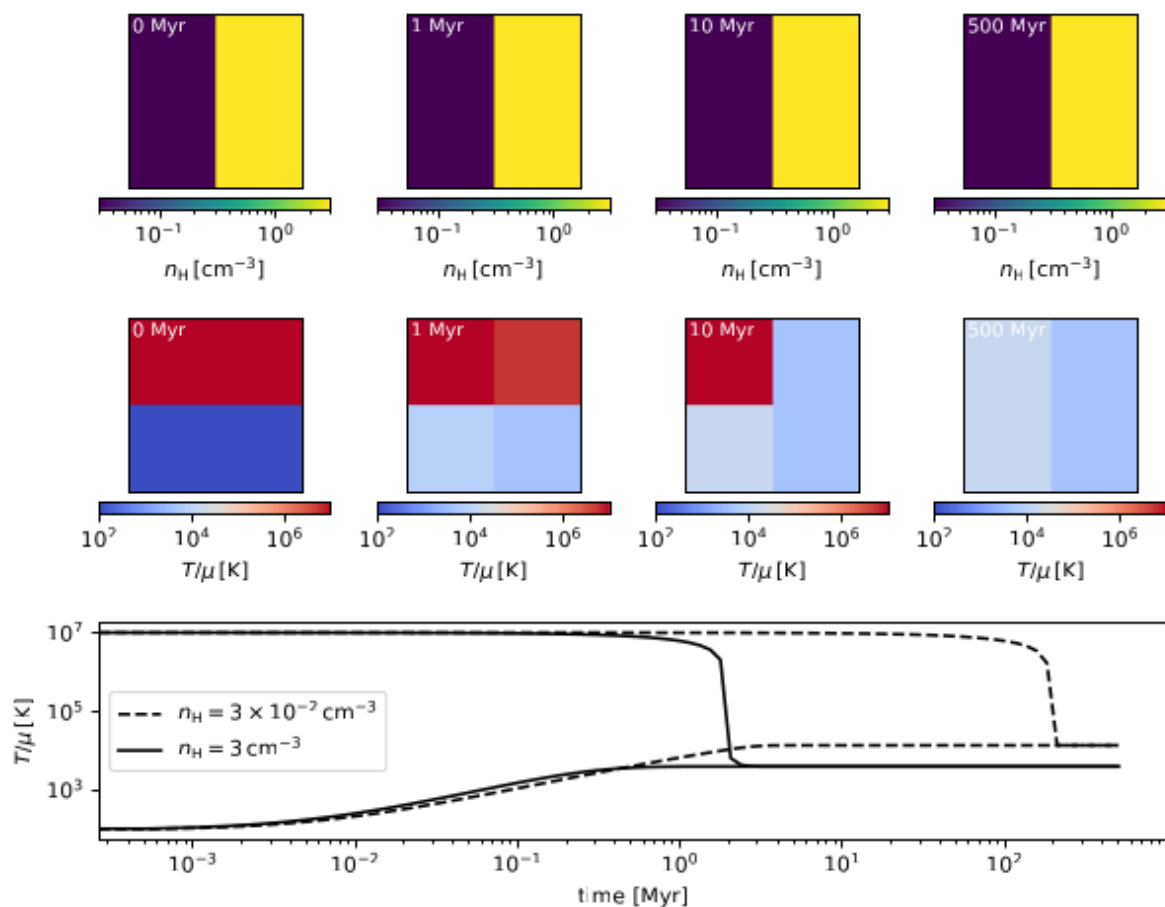


Figure 3: hydro/cooling-eq test

# New tests

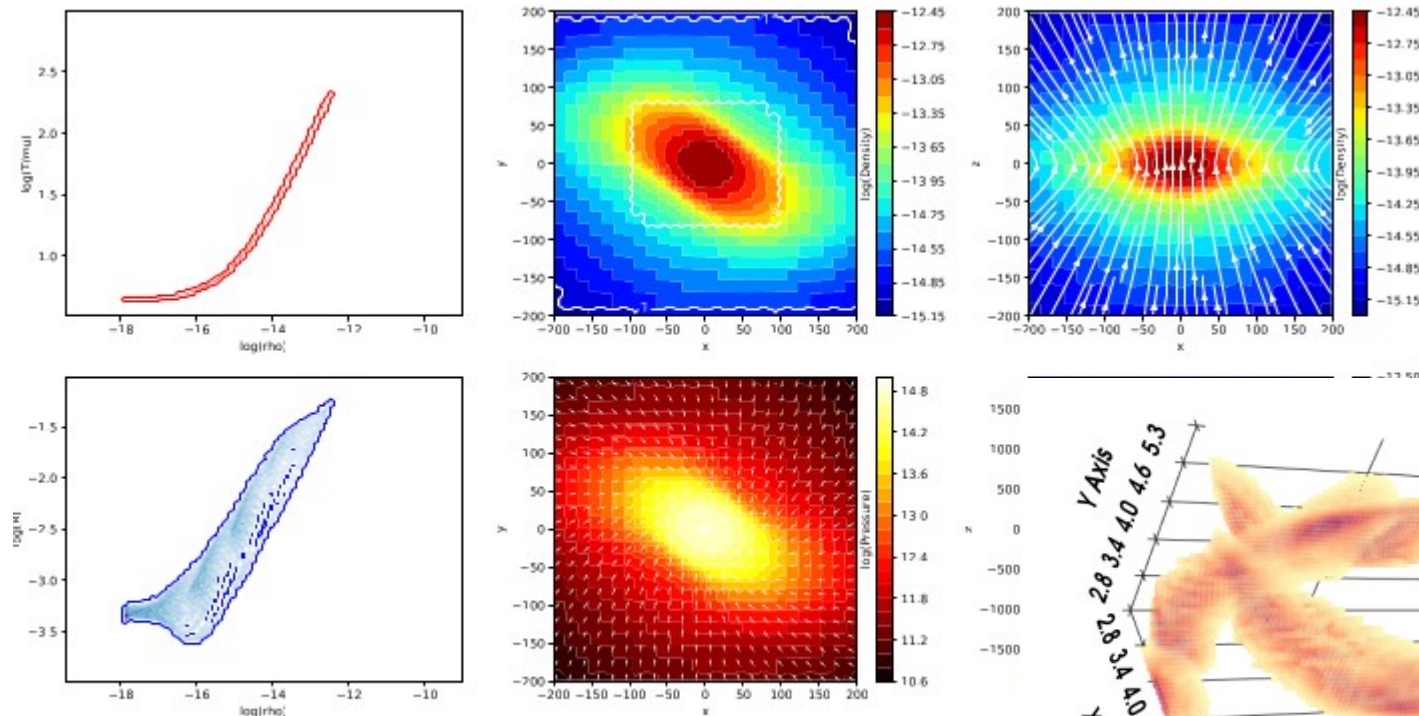


Figure 12: mhd/collapse-baro test

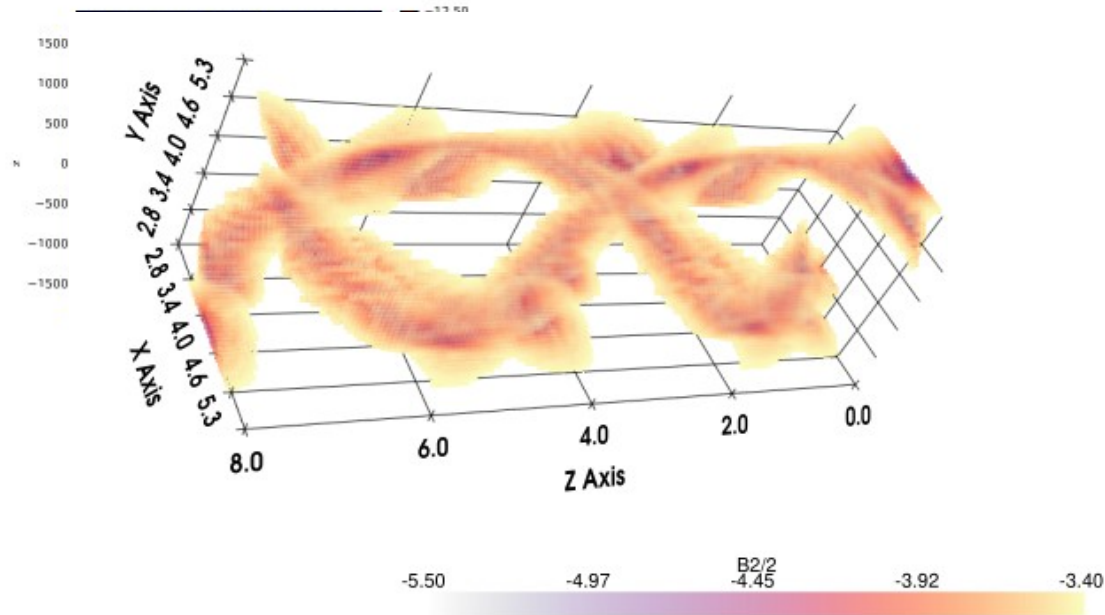


Figure 16: mhd/ponomarenko-dynamo test

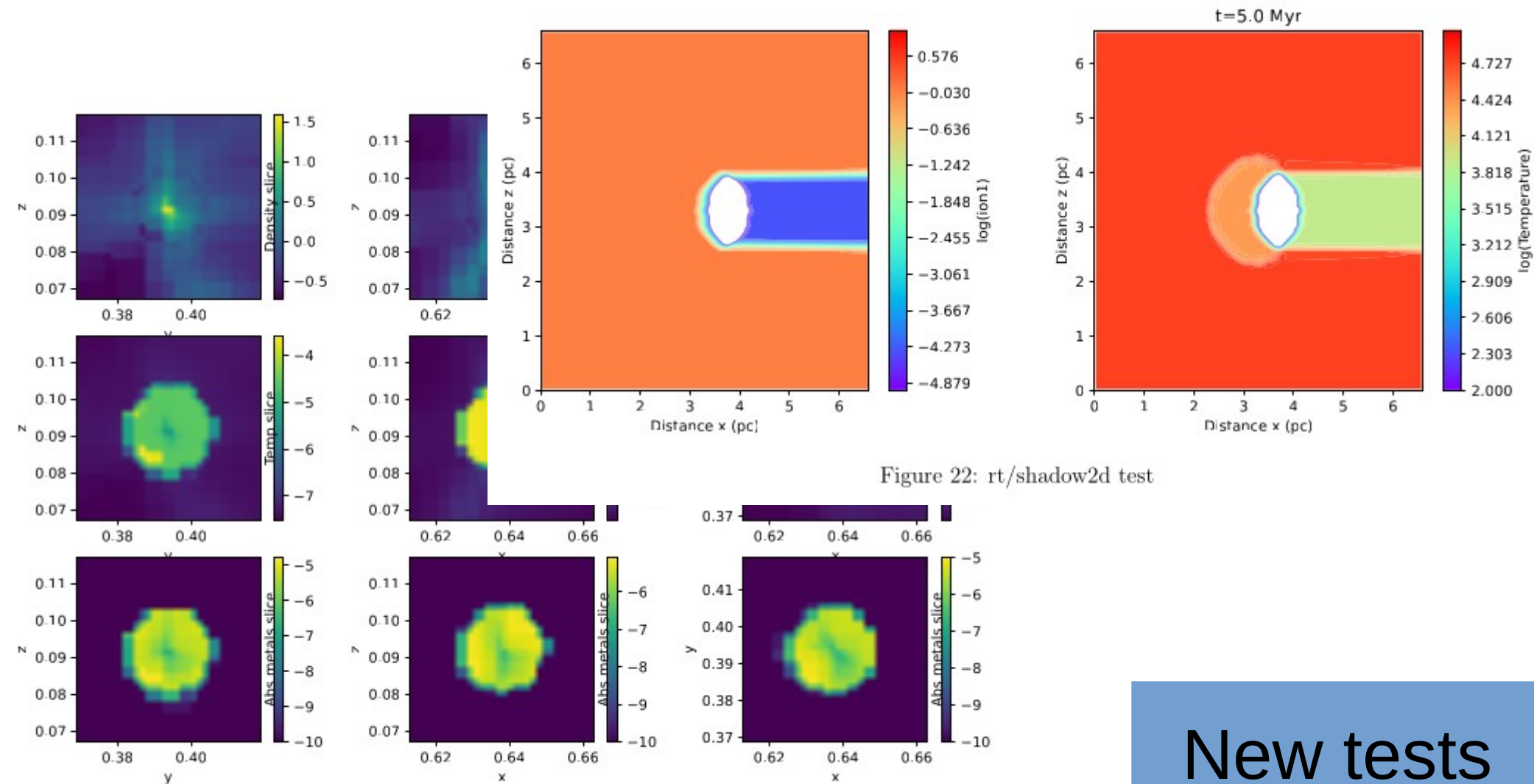


Figure 22: rt/shadow2d test

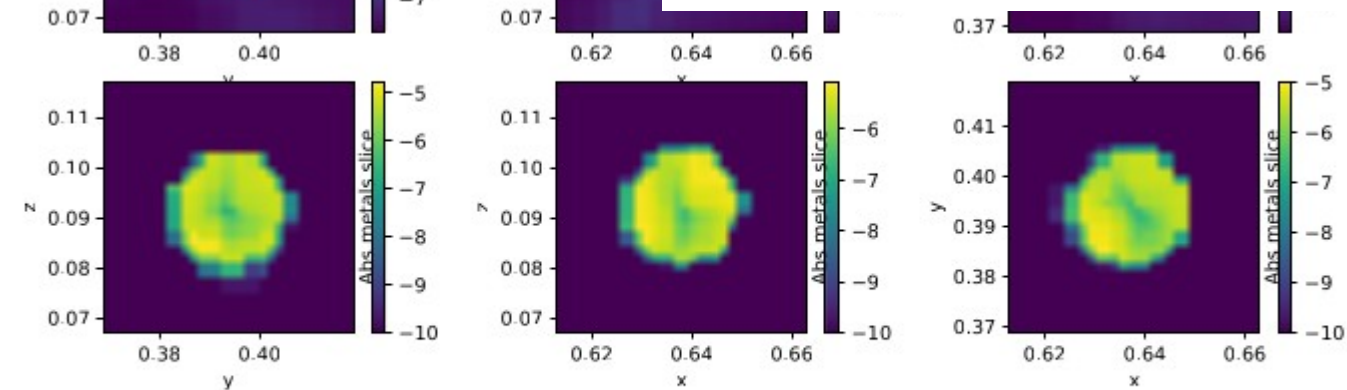


Figure 30: star/SNFB test

New tests

# Test infrastructure improvements

- Obtain coverage statistics (-s)
- Option to test restarts (-r)
- Framework for comparison against analytical solution
- Framework for running same test with different namelist parameters

# Testing restarts

Restarts are not precise up to machine precision #123

Open

Bug



nbrucy opened on Jun 11

Collaborator ...

## How to reproduce

Run the test suite with the restart option activated.

In `tests`,

```
./run_test_suite.sh -rv -p 2
```



## Expected behaviour

The test passes

## Actual result

Some of the tests fail because of small errors that are slightly above the tolerance. The issue can be mitigated by storing the conservative variables instead of the primitive ones (done in ramses-ism)

|     | Test name                         | Run time | Total time | Status |
|-----|-----------------------------------|----------|------------|--------|
| new | 1 hydro/advect1d                  | 0h0m3s   | 0h0m21s    | passed |
|     | 2 hydro/barotrop                  | 0h0m4s   | 0h0m22s    | failed |
| new | 3 hydro/cooling-eq                | 0h0m7s   | 0h0m25s    | passed |
|     | 4 hydro/cooling-frig              | 0h0m51s  | 0h1m19s    | passed |
|     | 5 hydro/implosion                 | 0h2m9s   | 0h2m27s    | passed |
|     | 6 hydro/isothermal                | 0h0m5s   | 0h0m23s    | failed |
| new | 7 hydro/mixing-scalar             | 0h2m52s  | 0h3m11s    | passed |
| new | 8 hydro/sedov3d                   | 0h0m3s   | 0h0m33s    | passed |
|     | 9 hydro/sod-tube                  | 0h5m45s  | 0h6m2s     | passed |
| new | 10 hydro/sod-tube-nener           | 0h0m2s   | 0h0m20s    | passed |
| new | 11 mhd/abc-flow                   | 0h6m0s   | 0h6m27s    | passed |
| new | 12 mhd/collapse-baro              | 0h2m1s   | 0h2m28s    | passed |
|     | 13 mhd/imhd-tube                  | 0h0m6s   | 0h0m24s    | passed |
| new | 14 mhd/imhd-tube-nener            | 0h0m7s   | 0h0m26s    | passed |
|     | 15 mhd/orszag-tang                | 0h2m42s  | 0h3m1s     | passed |
| new | 16 mhd/ponomarenko-dynamo         | 0h9m46s  | 0h10m13s   | passed |
|     | 17 poisson/ana-disk-potential     | 0h0m5s   | 0h0m22s    | passed |
| new | 18 poisson/cosmo                  | 0h6m16s  | 0h6m50s    | passed |
| new | 19 rt/cooling-neq                 | 0h0m5s   | 0h0m27s    | passed |
| new | 20 rt/crossing-beams              | 0h0m8s   | 0h0m30s    | passed |
| new | 21 rt/rt-dirac                    | 0h11m49s | 0h12m20s   | passed |
| new | 22 rt/shadow2d                    | 0h0m52s  | 0h1m14s    | passed |
|     | 23 rt/stromgren2d                 | 0h0m40s  | 0h1m1s     | passed |
| new | 24 rt/stromgren2d-He              | 0h1m33s  | 0h1m54s    | passed |
|     | 25 sink/center-SN                 | 0h5m34s  | 0h6m8s     | failed |
|     | 26 sink/smbh-bondi                | 0h2m36s  | 0h3m24s    | failed |
|     | 27 sink/spawning                  | 0h7m22s  | 0h7m49s    | passed |
|     | 28 sink/stellar-HII               | 0h4m6s   | 0h4m58s    | failed |
|     | 29 sink/stellar-spawn             | 0h2m53s  | 0h3m44s    | failed |
| new | 30 star/SNFB                      | 0h8m11s  | 0h8m46s    | passed |
|     | 31 turb/driving                   | 0h1m27s  | 0h1m55s    | passed |
|     | 32 tracer/sedov                   | 0h1m21s  | 0h1m40s    | passed |
| new | 33 tracer/sedov-classical-tracers | 0h2m14s  | 0h2m33s    | passed |

# Parameter scans & analytical checks

Report the number of failed param combinations

ana\_parameters.py X

tests > hydro > sod-tube > ana\_parameters.py > params

Noé Brucy, 5 months ago | 1 author (Noé Brucy)

```
1 params = {
2     "hydro_params/riemann" : ["hllc", "hll", "acoustic", "exact", "llf"],
3     "hydro_params/slope_type" : [1, 2, 3, 4, 6, 7, 8], # Note slope type 5
4     "refine_params/interpol_var" : [0, 1, 2],
5     "refine_params/interpol_type" : [0, 1, 2, 3, 4],
6 }
7
```

sod-tube-parameter-study.csv U X

tests > hydro > sod-tube > sod-tube-parameter-study.csv

```
1 test_name_combi,error
2 riemann_hllc_slope_type_1_interpol_var_0_interpol_type_0,1.8093934291769342e-01
3 riemann_hllc_slope_type_1_interpol_var_0_interpol_type_1,1.8105612832002990e-01
4 riemann_hllc_slope_type_1_interpol_var_0_interpol_type_2,1.8171039490270324e-01
5 riemann_hllc_slope_type_1_interpol_var_0_interpol_type_3,1.8072711180140497e-01
6 riemann_hllc_slope_type_1_interpol_var_0_interpol_type_4,1.8072711180140497e-01
7 riemann_hllc_slope_type_1_interpol_var_1_interpol_type_0,1.8096035247728015e-01
8 riemann_hllc_slope_type_1_interpol_var_1_interpol_type_1,1.8106664332840927e-01
9 riemann_hllc_slope_type_1_interpol_var_1_interpol_type_2,1.8169600795575536e-01
10 riemann_hllc_slope_type_1_interpol_var_1_interpol_type_3,1.8073866983822082e-01
11 riemann_hllc_slope_type_1_interpol_var_1_interpol_type_4,1.8073866983822082e-01
12 riemann_hllc_slope_type_1_interpol_var_2_interpol_type_0,1.8096035247728137e-01
13 riemann_hllc_slope_type_1_interpol_var_2_interpol_type_1,1.8102492467389369e-01
14 riemann_hllc_slope_type_1_interpol_var_2_interpol_type_2,1.8171642879143224e-01
15 riemann_hllc_slope_type_1_interpol_var_2_interpol_type_3,1.8072880164806851e-01
```

# Test suite coverage

Initially: 47.63 % (16828/35334 lines)

Current: **63.02 %** (21428/34000 lines)

- amr            63.63 % ( 4361 / 6853 )
- hydro        70.09 % ( 3263 / 4655 )
- mhd          75.16 % ( 3638 / 4840 )
- pm            54.71 % ( 6587 / 12039 )
- poisson      72.31 % ( 1532 / 1848 )
- rt            50.92 % ( 1644 / 3228 )
- turb         77.12 % ( 381 / 494 )