
Main differences from the original source files

par_ini.d

```

1 #####
2 ## parameters for COSMOS code #####
3 ## ver1.00 by Chulmoon Yoo #####
4 #####
5 999999 # maximum step of the main loop
6 400. # maximum time to evolve
7 3 # tab number of the bufer grids
8 10. # amp
9 -60 # minimum grid number of x = -nmax-1
10 60 # maximum grid number of x = imax/2-1
11 0 # minimum grid number of y
12 60 # maximum grid number of y
13 0 # minimum grid number of z
14 60 # maximum grid number of z
15 -1. # minimum coordinate of x
16 1. # maximum coordinate of x
17 0. # minimum coordinate of y
18 1. # maximum coordinate of y
19 0. # minimum coordinate of z
20 1. # maximum coordinate of z

```

```

1 #####
2 ## parameters for COSMOS code #####
3 ## ver1.00 by Chulmoon Yoo #####
4 #####
5 3 # maximum step of the main loop
6 70. # maximum time to evolve
7 3 # tab number of the bufer grids
8
9 -40 # minimum grid number of x = -nmax-1
10 40 # maximum grid number of x = imax/2-1
11 0 # minimum grid number of y
12 40 # maximum grid number of y
13 0 # minimum grid number of z
14 40 # maximum grid number of z
15 -1. # minimum coordinate of x
16 1. # maximum coordinate of x
17 0. # minimum coordinate of y
18 1. # maximum coordinate of y
19 0. # minimum coordinate of z
20 1. # maximum coordinate of z

```

simulation max steps and finish time

number of grids 60 -> 40

par_ini.d

```

33 #####
34 ### initial data parameter
35 #####
36 0. .... # 0:no continue 1:continue
37 ini_all.dat .... # continue file
38 0.50 .... # amplitude
39 10. .... # wave number
40 10. .... # xi2 nonsphericity parameter 1
41 0. .... # xi3 nonsphericity parameter 2
42 0. .... # w3 alignment angle
43 0. .... # amplitude for the scalar field
44 10. .... # wave number for the scalar field
45 15. .... # xi2s
46 0. .... # xi3s
47 50.0 .... # Hubble

```

continue setting

```

33 #####
34 ### initial data parameter
35 #####
36 1. .... # 0:no continue 1:continue
37 ini_all.dat .... # continue file
38 0.83 .... # amplitude
39 10. .... # wave number
40 0. .... # xi2 nonsphericity parameter 1
41 0. .... # xi3 nonsphericity parameter 2
42 0. .... # w3 alignment angle
43 0. .... # amplitude for the scalar field
44 10. .... # wave number for the scalar field
45 15. .... # xi2s
46 0. .... # xi3s
47 50.0 .... # Hubble

```

initial amplitude
for the perturbation
nonsphericity parameter ->0

not used in adiabatic_spherical

```

57 #####
58 ### parameters for output
59 #####
60 0.5 .... #1st part print interval boundary time
61 0.5 .... #2nd part
62 100. .... #changing time for print interval

```

```

57 #####
58 ### parameters for output
59 #####
60 10.0 .... #1st part print interval boundary time
61 10.0 .... #2nd part
62 100. .... #changing time for print interval

```

output interval setting

cosmos.cpp

```

267 + //setting for bools start
268 + fld=true; + + + + + // fluid evolution -> true/false
269 + scl=true; + + + + + // scalar evolution -> true/false
270 + cuev=true; + + + + + // curvature evaluation -> true/false

```

```

267 + //setting for bools start
268 + fld=true; + + + + + // fluid evolution -> true/false
269 + scl=false; + + + + + // scalar evolution -> true/false
270 + cuev=false; + + + + + // curvature evaluation -> true/false

```

no scalar field and curvature calculation

```

381 + else
382 + {
383 +     cout << "no continue" << endl;
384 +
385 +     //initial data setting start
386 +     //fmv->set_initial_scalar(mus,kks,xi2s,xi3s);
387 +     //pragma omp barrier
388 +     fmv->initial_nonsph(mu,kk,xi2,xi3,xi2s,xi3s,w3);
389 +     // fmv->initial(mu);
390 +     #pragma omp barrier
391 +     printpack(fmv0,ln,pk,pl,filex,filey,filez,filex0z,filexy0);
392 +     //initial data setting end
393 +
394 +     //printpack(fmv0,ln,pk,pl,filex,filey,filez,filex0z,filexy0);
395 + }
396 + //reading continue or setting initial date end

```

```

398 + else
399 + {
400 +     cout << "no continue" << endl;
401 +
402 +     //initial data setting start
403 +     //fmv->set_initial_scalar(mus,kks,xi2s,xi3s);
404 +     //pragma omp barrier
405 +     //fmv->initial_nonsph(mu,kk,xi2,xi3,xi2s,xi3s,w3);
406 +     fmv->initial_nonsph(mu,kk,xi2,xi3);
407 +     // fmv->initial(mu);
408 +     #pragma omp barrier
409 +     //printpack(fmv0,ln,pk,pl,filex,filey,filez,filex0z,filexy0);
410 +     //initial data setting end
411 +
412 +     //printpack(fmv0,ln,pk,pl,filex,filey,filez,filex0z,filexy0);
413 + }
414 + //reading continue or setting initial date end

```

initial data setting function changed

makefile

```
33 # source file
34 SRC = $(PROG).cpp cosmos_bssn.cpp cosmos_initial.cpp cosmos_output.cpp cosmos_boundary.cpp cosmos_ahf.cpp cosmos_ipol.cpp
    cosmos_fluid.cpp cosmos_fmr.cpp
35 OBJS = $(SRC:%.$(LANG)=%.o)
```



```
33 # source file
34 SRC = $(PROG).cpp ../cosmos_bssn.cpp ../cosmos_initial.cpp ../cosmos_output.cpp ../cosmos_boundary.cpp ../cosmos_ahf.cpp ../cosmos_ipol.
    cpp ../cosmos_fluid.cpp ../cosmos_fmr.cpp
35 OBJS = $(SRC:%.$(LANG)=%.o)
```

- cosmos.cpp is used instead of the original
../cosmos.cpp and ../cosmos_bssn.cpp