

AWESOME documentation

metal enrichment setup 2011ff

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FOR INTERNAL AWESOME USE

1 Initial Conditions

1.1 Using Cosmics 1.04 (Standard)

The (constrained) initial conditions generator `Cosmics 1.04` can be downloaded from <http://web.mit.edu/edbert/cosmics-1.04.tar.gz>. The actually used version is to be gotten as git repository `git@github.com:harre/cosmics-initial-conditions.git`.

Step 1: Make For making, one has to specify the system and adapt the corresponding Makefile accordingly. In the folder `Make_files` one has to adapt `Make.LINUX` to

```
F77 = ifort
F77FLAGS = -O2 -parallel -par-report1 -openmp
FFT_OBJ = fft3r.o
CC = icc
CFLAGS = -O2 -parallel -par-report1 -openmp
```

and load the intel compiler module `load intel/64/12.1`. The intel compiler is used since for 512^3 particle initial conditions there is a problem with memory allocation with `gcc` (can be dealt with flags however). When one uses the version from the git repo, changing the Makefile should not be necessary anyhow.

Step 2: Linear Extrapolation: linger In the folder `linger_syn` the program with the same name is to be executed. This program generates a file called `linger.dat` which is then used by the actual IC generator `grafic`.

When one executes the program from github, the message

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```
>>>> MAKE SURE YOU START THE PROGRAM WITH
>>>> $./linger_syn | tee lingersynIO.out
```

motivates the recording of IO in order to ensure reproducibility of simulations. Ideally one would also indicate some physical parameters in the IO file, such as `lingersynIO_h70.out`.

Note: There are files already in the repo which can be used, namely `linger_h100n216.dat` and `linger_h70n216.dat` for Hubble constants 70.3 and 100. They were generated using matter transfer functions (choice 0)

```
Enter 1 for full Boltzmann equation for CMB (lmax<=10000, linear k)
    or 0 for matter transfer functions only (lmax=100, log k)
```

and the parameters

```
Enter kmin (1/Mpc), kmax (1/Mpc), nk, zend
```

are set to 1E-5, 50, 216, 0. The last input is then which kind of IC one wants to generate

Initial conditions cases:

- 1 for isentropic (adiabatic) fluctuations,
- 2 for cdm entropy/isocurvature fluctuations, or
- 3 for baryon entropy/isocurvature fluctuations, or
- 4 for seed/isocurvature fluctuations

```
Enter 1, 2, 3, or 4 now
```

where we chose 2.

Note: If one changes the cosmological parameters for `linger_syn` one usually has to delete the files `linger.dat` and `lingerg.dat` first.

1.2 Using NGenIC

2 N-body Simulation

3 Halo Finder + Merger Trees

4 SAM

4.1 Galacticus

4.1.1 Compilation

4.2 Galacticus v0.9.1

Checkout latest revision:

```
bzr checkout http://bazaar.launchpad.net/~abenson/galacticus/v0.9.1/
```

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