Simulation of large scale structure

Fifth presentation for the Scientific Modelling Computer Lab

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Overview

- running the simulation (4. report)
- visualization with python (4. report)
- new plots about the slices (5. report)
- comparision with observations (5. report)

Running the simulation

Large scale structure simulation $\Rightarrow$ cosmological parameters.

The simulation:

- making glass with Gadget-2
- creating initial conditions with N-GenIC
- running the simulation
- fault: the boxsize parameter was not the same in the parameterfiles

Parameters

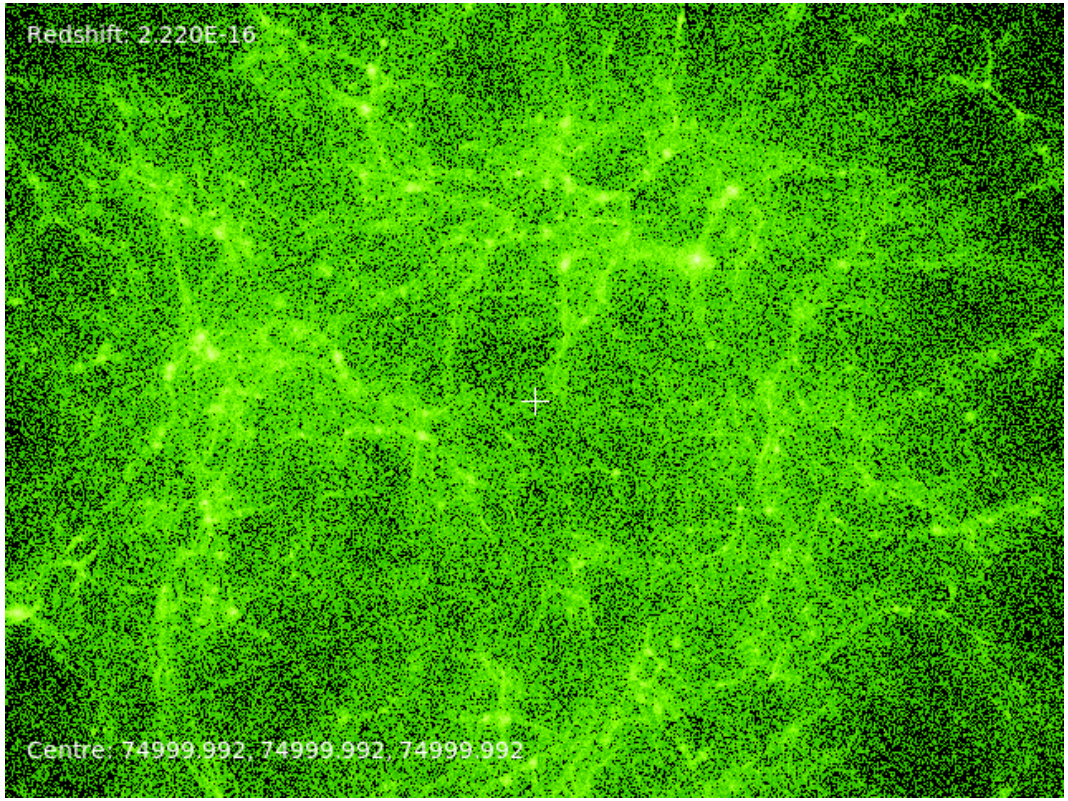
In the parameterfile of Gadget-2:

- TimeBegin 0.0008975124
- TimeMax 1.0
- BoxSize 150000.0

in the parameterfile of N-GenIC:

- Nmesh 100
- Nsample 100
- Box 150000.0
- TileFac 2
- Redshift 1000

Results



https://github.com/MariaPalfi/Scientific-modelling-lab/blob/master/lss_evol.gif

Pygadgetreader

https://bitbucket.org/rthompson/pygadgetreader/src/default/

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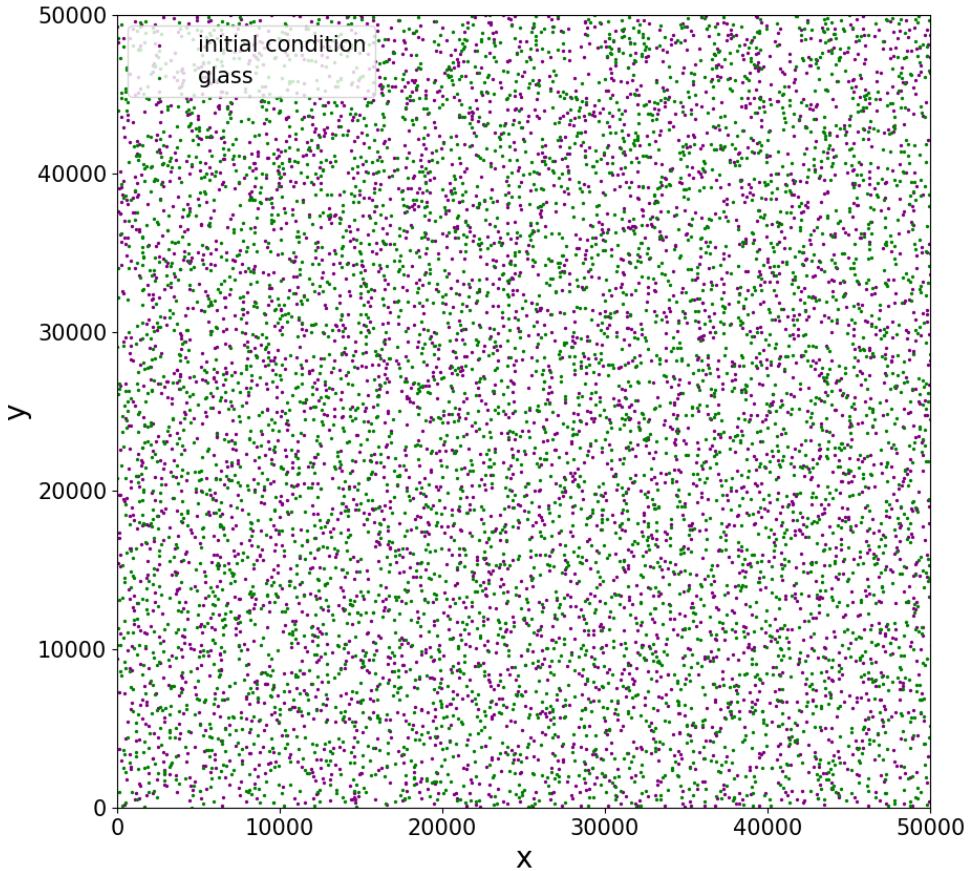
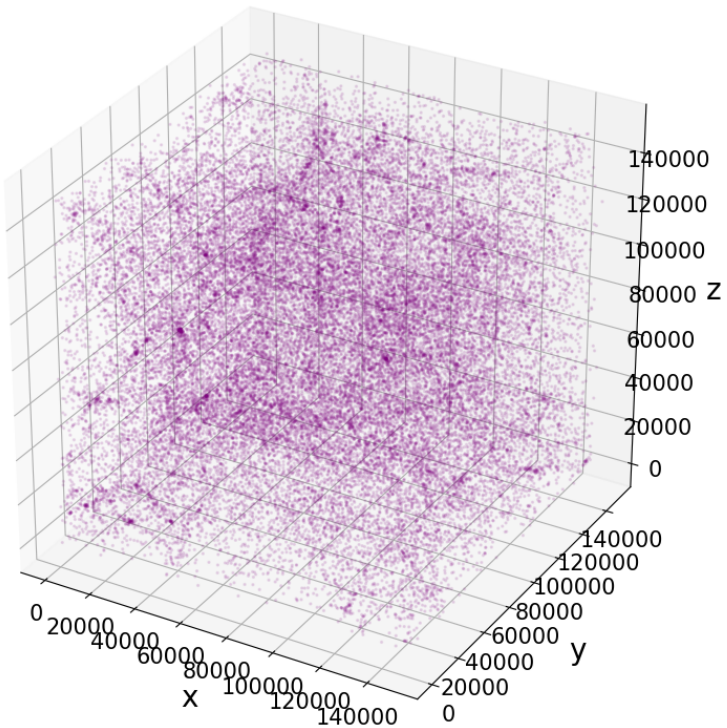
matplotlib.pyplot and mpl_toolkits.mplot3d

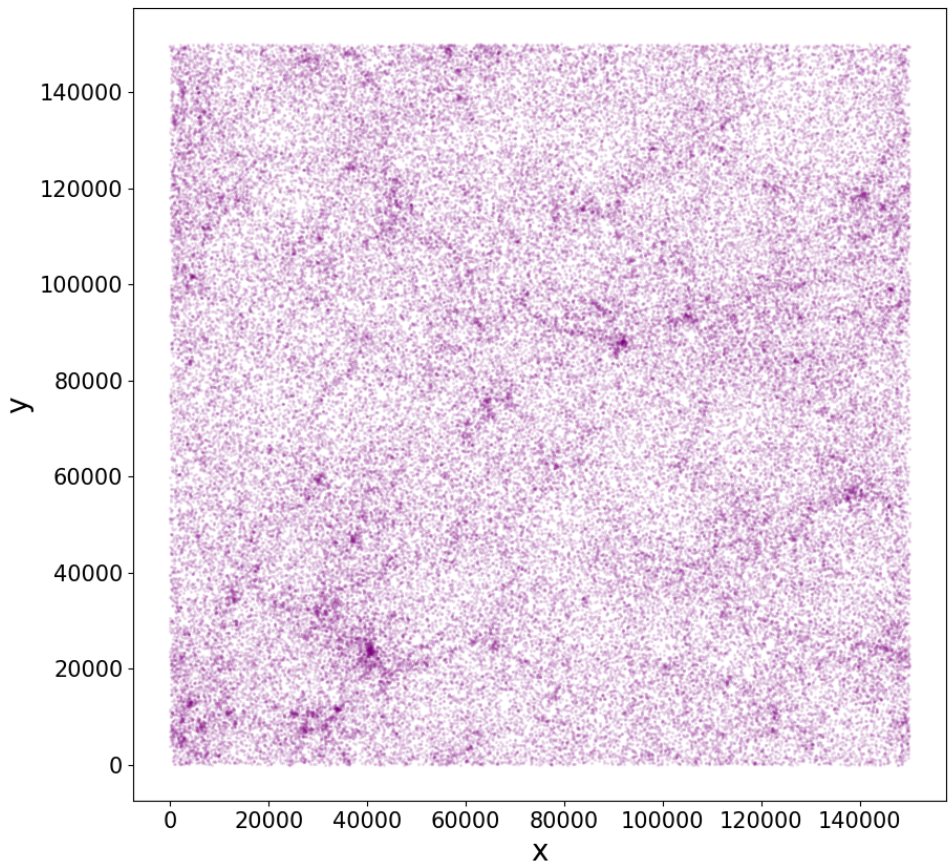
The position of the particles in the glass and in the initial condition with every 200th particles for comparison



A 3D plot about the large scale structure with every 200th particles.



A 2D plot about the large scale structure with every 100th particles.



Plotting the slices

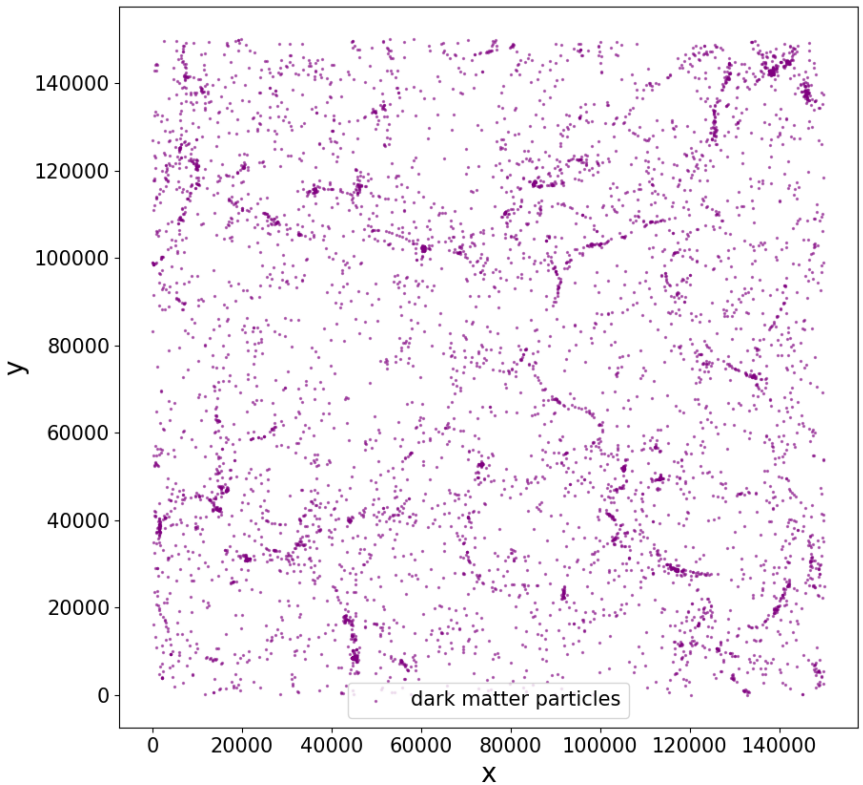


Figure: A 2D plot about the large scale structure, if $100 < z < 200$.

Plotting the slices

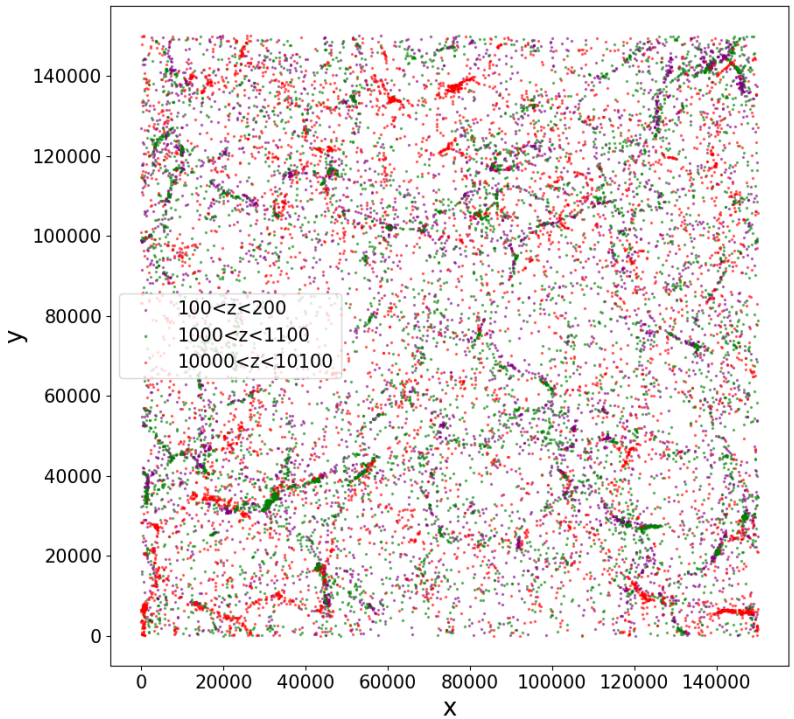
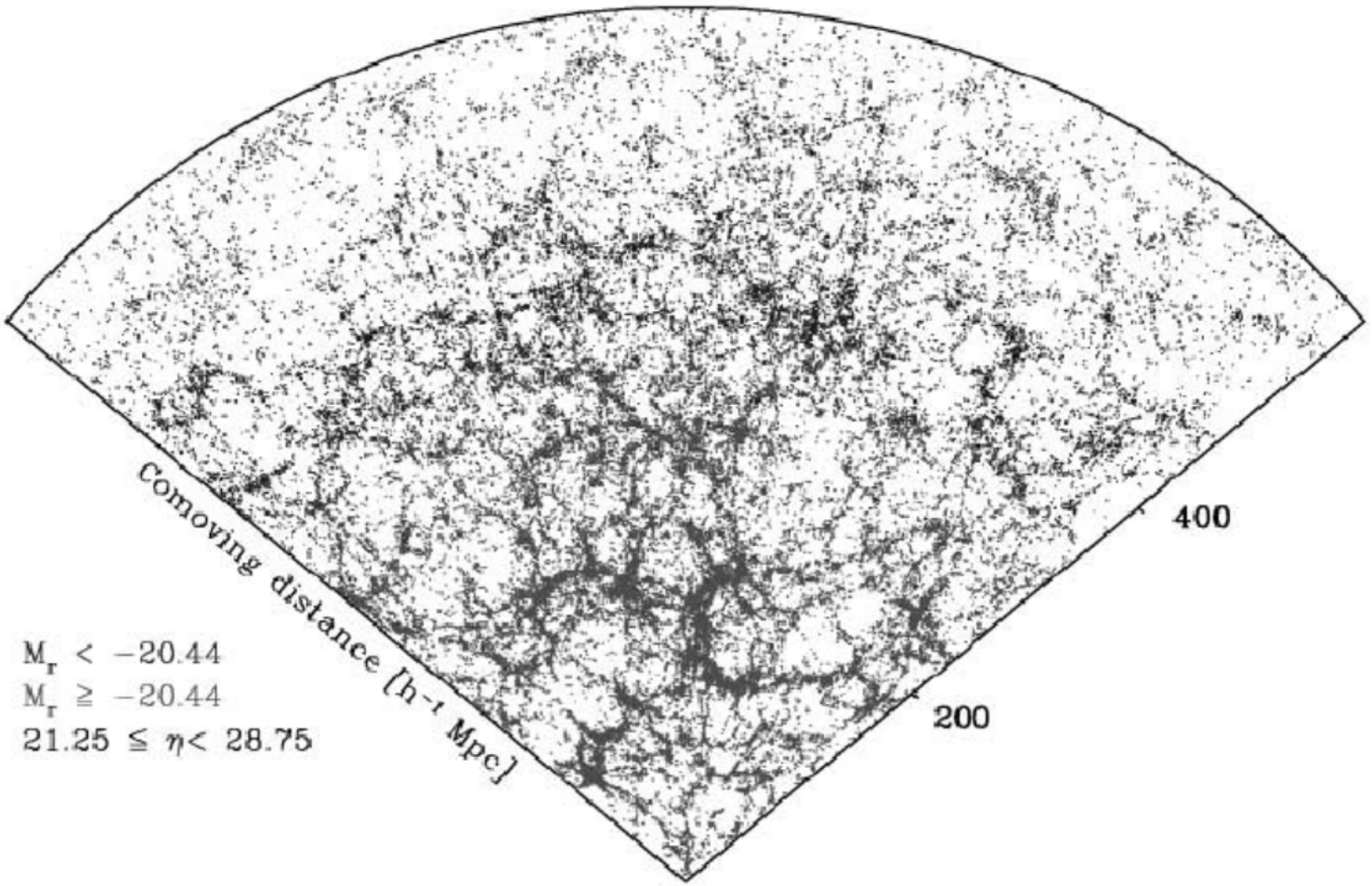


Figure: 2D plots about the large scale structure at given z coordinate intervals.

Comparision with the SDSS observations

Park et al. 2005, ApJ, 633, 11



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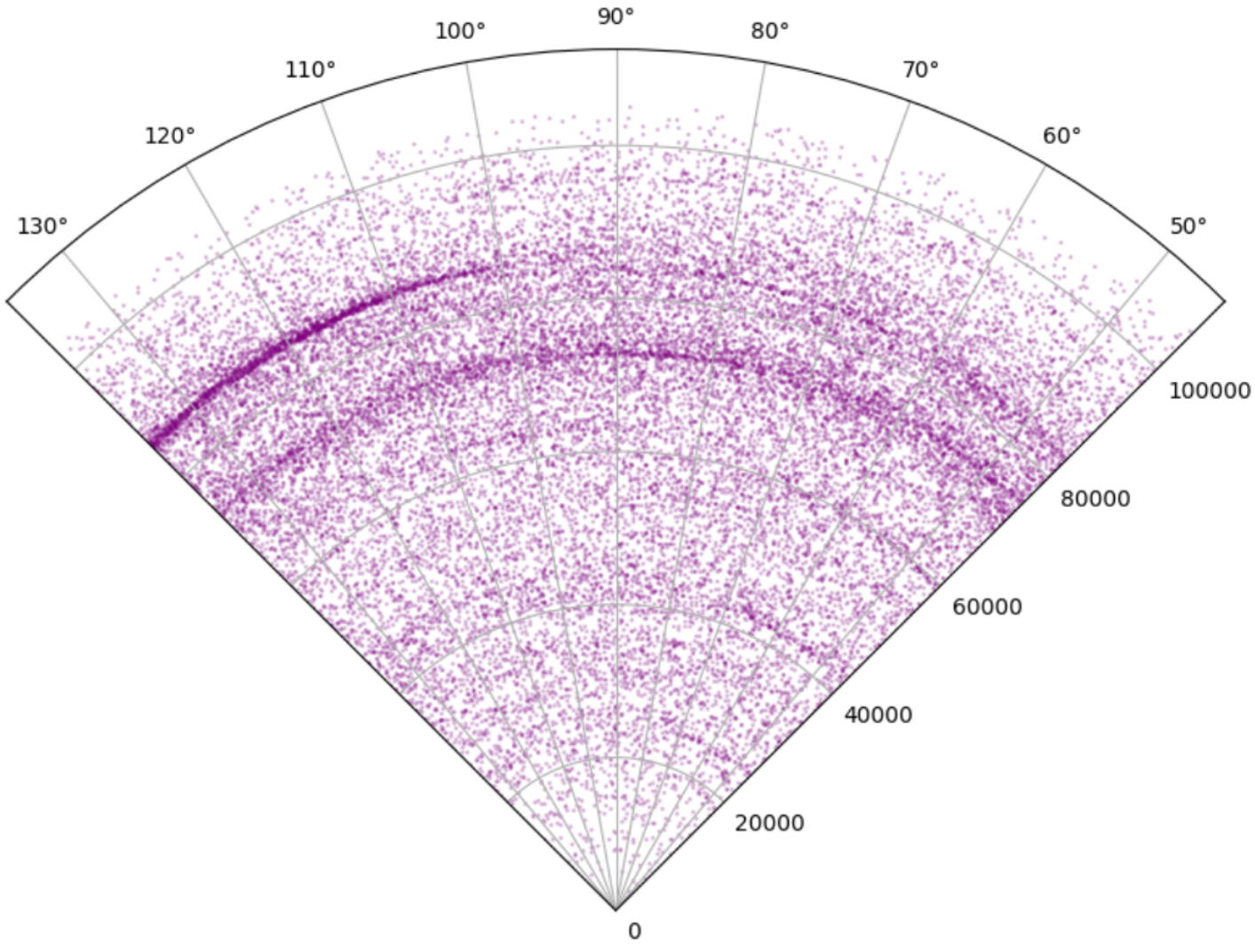

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- running the large scale structure simulation
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Next steps:

- finish the comparision
- write the midterm report
- prepare for the midterm presentation