

Mini-Millennium

This simulation is good for

- Modelling galaxies with stellar mass between $\sim 10^{8.5} M_{\text{sun}}$ and the knee of the mass function
- Running tests for Box-type data products

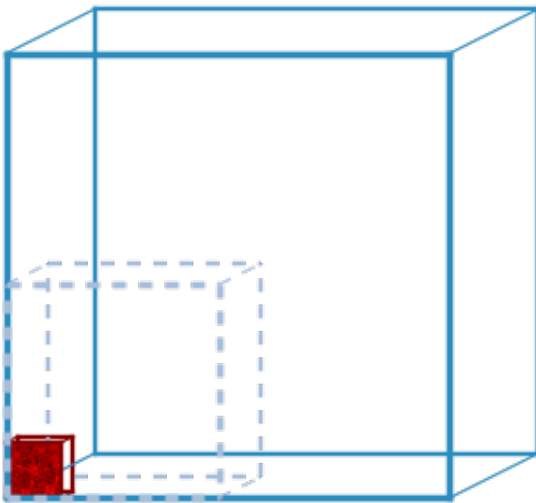
Overview

This simulation carries the same cosmology and resolution as the full [Millennium](#) simulation, but is simply a smaller periodic box. Semi-analytic models are typically calibrated on smaller versions of simulations, like Mini-Millennium, before the full simulation catalogues are produced. Mini-Millennium is recommended for those who want to quickly sample data products from *TAO*. The smaller data volume is much easier to handle for testing pipelines, and results concerning galaxies (with the exception of those in massive clusters) should be representative of the larger simulation.

Size

Box length: $62.5 h^{-1} \text{ cMpc}$

Relative volume to [Millennium](#) and an all-sky survey out to $z=0.05$:



Resolution

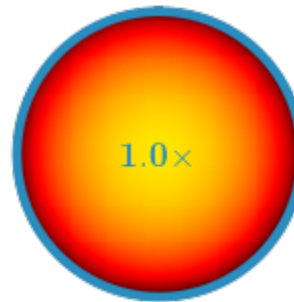
Particle mass: $8.6 \times 10^8 h^{-1} M_{\text{sun}}$

Gravitational softening: $5 h^{-1} \text{ ckpc}$

Number of particles: 270^3

Number of snapshots to $z=0$: 64

Particle size compared to [Millennium](#):



The mass resolution of Millennium and Mini-Millennium are identical.

Cosmology

The cosmological parameters of the Mini-Millennium simulation are based on *WMAP*-1 data ([Spergel et al. 2003](#)) and the 2dF Galaxy Redshift Survey ([Colless et al. 2001](#)).

$\Omega_m = 0.25$

$\Omega_b = 0.045$

$h = 0.73$

$\Omega_b = 0.045$

$n = 1$

$h = 0.73$

Halo

Halo and subhalo were identified using the popular [SUBFIND](#) code. The merger trees of these halo were subsequently built using LHALOTREE, which is described in the [Supplementary Information](#) of the [Millennium](#) paper. (Sub)Halo required a minimum of 20 particles to be included in the trees.

Semi-analytic galaxies

Galaxy catalogues for the Mini-Millennium simulation available on *TAO* have been built with the following semi-analytic models:

[SAGE](#)
[Dark Sage](#)