

GiggleZ-MR

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This simulation is good for

- Modelling galaxies with stellar mass above $\sim 10^{8.5} M_{\text{sun}}$
- Galaxy evolution studies with volume-limited low-redshift surveys

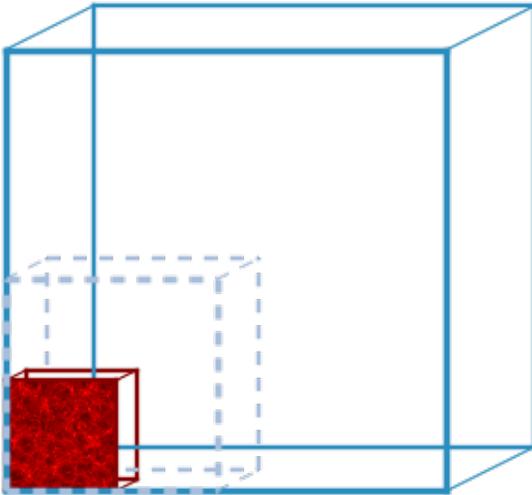
Overview

The GiggleZ-MR simulation is one of many in the Gigaparsec WiggleZ cosmological N -body simulation suite (Poole et al. 2015), which were performed with GADGET2. This "Medium Resolution" run is currently the only one of the suite available on TAO. GiggleZ-MR offers a similar mass resolution to Millennium but has more up-to-date cosmology and a more in-depth construction of merger trees.

Size

Box length: $125 h^{-1} \text{ cMpc}$

Relative volume to Millennium and an all-sky survey out to $z=0.05$:



Resolution

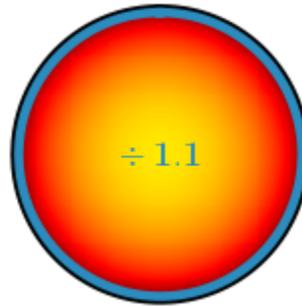
Particle mass: $9.5 \times 10^8 h^{-1} M_{\text{sun}}$

Gravitational softening: $4.6 h^{-1} \text{ ckpc}$

Number of particles: 520^3

Number of snapshots to $z=0$: 59

Particle size compared to Millennium:



GiggleZ-MR has 1.1 times lower mass resolution than Millennium, meaning a Millennium halo contains 1.1 times the number of particles of a GiggleZ-MR halo of equivalent mass.

Cosmology

The cosmological parameters of the GiggleZ simulations are based on *WMAP-5* data, in addition to supernovae and baryonic acoustic oscillations (Kosmatsu et al. 2009).

$\Omega_m = 0.273$

$\Omega_b = 0.0456$

$h = 0.727$

$\Omega_b = 0.0456$

$\Omega_m = 0.812$

$n = 0.96$

$h = 0.705$

Halo

Halo and subhaloes were identified using the popular SUBFIND code. The merger trees of these halo were built according to the method to be presented in Poole et al. (in preparation). This approach repairs pathological defects in merger trees introduced by the halo-finding process (e.g., over linking, or the disappearance of halo during pericentric passages) through a process of forward and backward matching which scans both ways over multiple snapshots.

Semi-analytic galaxies

Galaxy catalogues for the GiggleZ-MR simulation available on TAO have been built with the following semi-analytic models:

SAGE