Projet Horizon - Horizon Project

-- Projet Horizon (site interne) - Science - Simulations à grandes échelles - Marenostrum Simulations - The huge run - Mare Nostrum @ z=4 --

Mare Nostrum @ z=4

Mare Nostrum @ z=4 Physics

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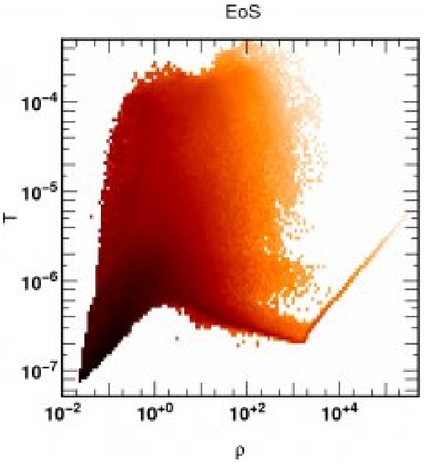
Thursday 9 November 2006

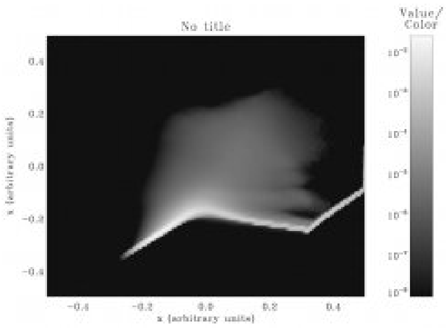
<PDF_LINK>

- 12th most massive halo Equation of state @ z=4 in code units for the temperature

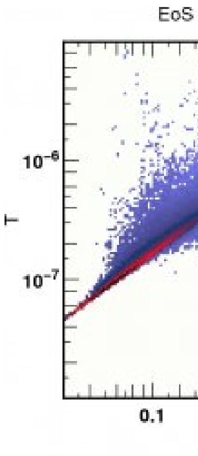


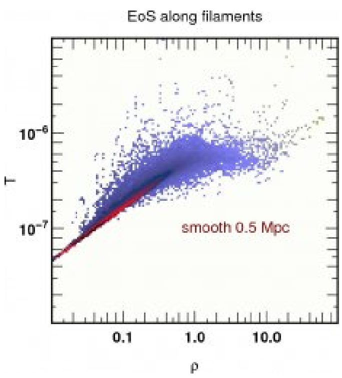
Equation of state of halo @ z=4 neightbourhood of high res halo.

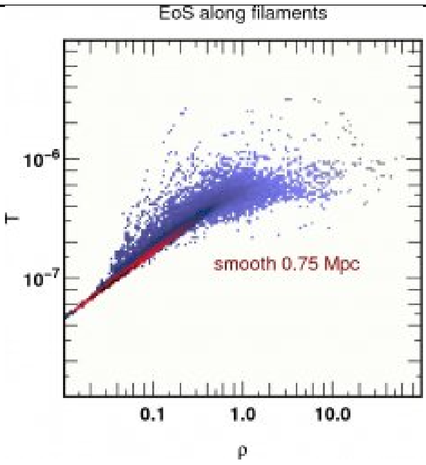
- Global Equation of state @ z=4



Equation of state of gas @ z=4 includes all cells in the simulations

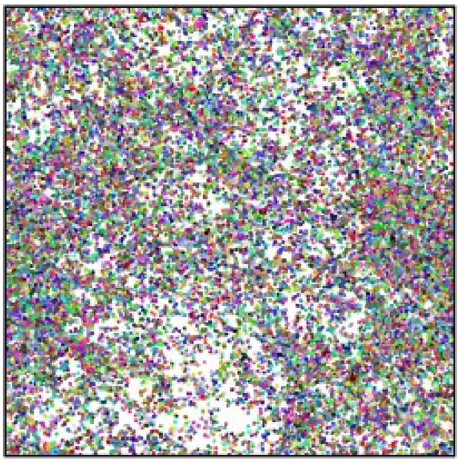






EoS skeleton @ z=4 minimal smothing. One probes the filaments of the voids as well.	EoS skeleton @ z=4 intermediaire smoothing	EoS skeleton @ z=4 larger smoothing. Only the major filaments are probed

- Friend of Friend @ z=4



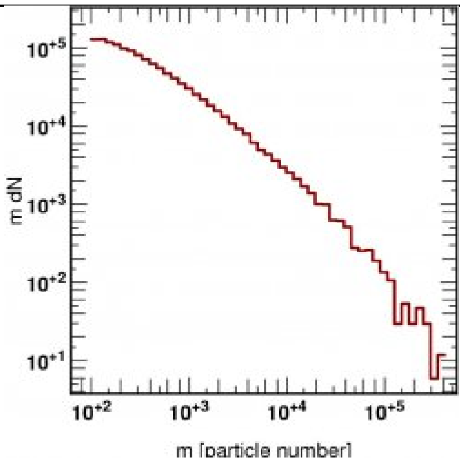
Friend of Friend of MN @ z=4 All structures with more than 1000 particles are shown. The FOF linking length is 0.2

The catalogs

Friend of Friend catalog The linking length was set to 0.2. WARNING the simulation was analysed as 8 segmented regions and the overlapping was not accounted for. Hence some halos at the boundary may have been cut or dropped.

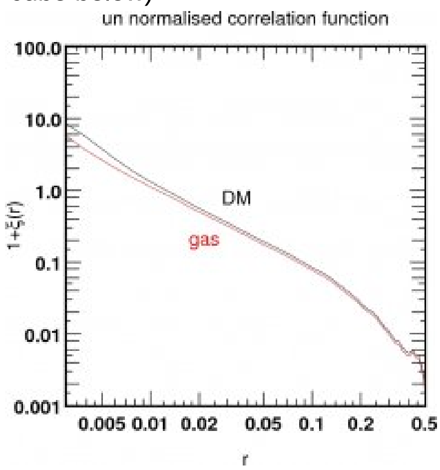
The first 500 halos of MN @ z=4 The linking length was set to 0.2. WARNING the simulation was analysed as 8 segmented regions and the overlapping was not accounted for. Hence some halos at the boundary may have been cut or dropped.

- Mass function of Dark Halos (using the above catalog)



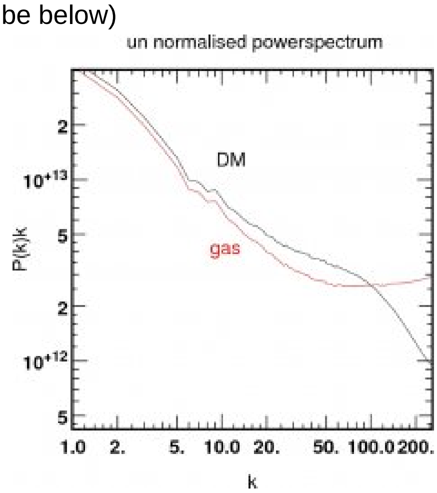
FOF mass function note the above caveat for halo identification

- Correlation function (using the cube below)



MN correlation function @ z=4 It was computed on a 512^3 grid. This is the correlation function of the contrast of the field.

- Power spectrum (using the cube below)

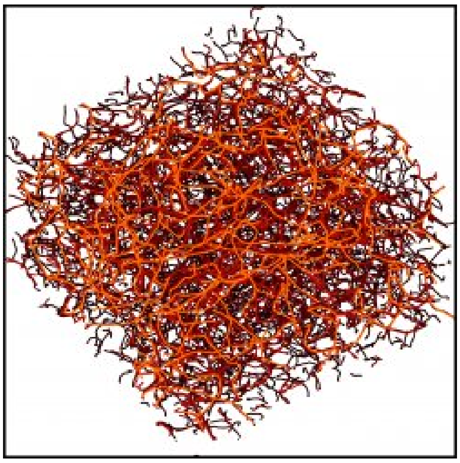


MN powerspectrum @ z=4 It was computed on a 512^3 grid. This is the power spectrum of the contrast of the field.

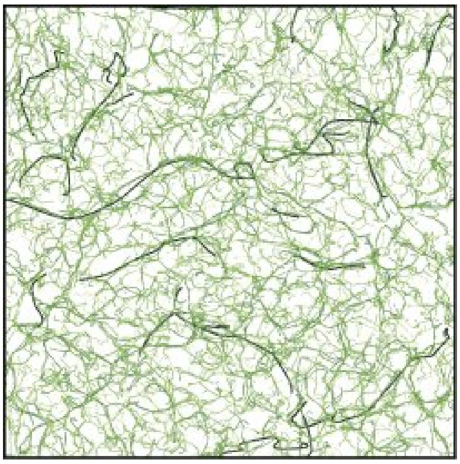
- Skeleton of gas @ z=4

skeleton of MN gas @ z=4 The different coloured curves correspond to smoothing length of 0.6, 0.9 1.2 and 1.5 Mpc/h. Note the tree structure of the skeleton as a ffunction of smoothing length. Note the similiraty with the DM skeleton

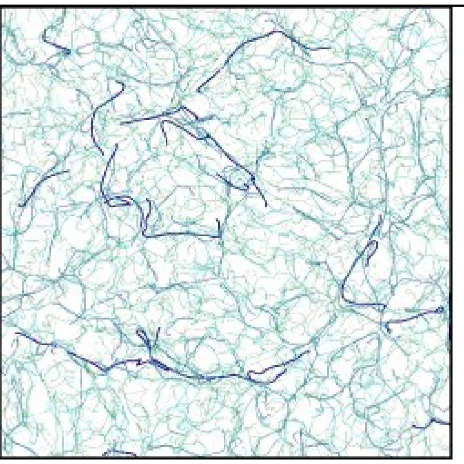
- Skeleton of Dark Matter @ z=4



Skeleton of MN Dark Matter @ z=4 The different coloured curves correspond to smoothing length of 0.6, 0.9 1.2 and 1.5 Mpc/h. Note the tree structure of the skeleton as a ffunction of smoothing length. Note the similiraty with the gas skeleton



skeleton slice DM with varring smoothing @ z=4 The skeleton is built for each sum of wavelet cubes. Hence the tree like structure of the skeleton.

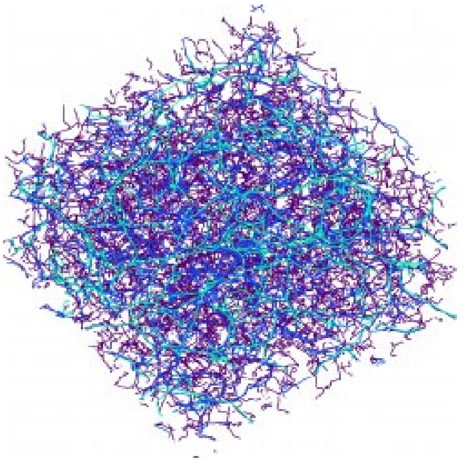


multiscale skeleton slice @ z=4 same as previously for a different slice at higher resolution.

It can also be viewed interactively as a 3D java applet at the following

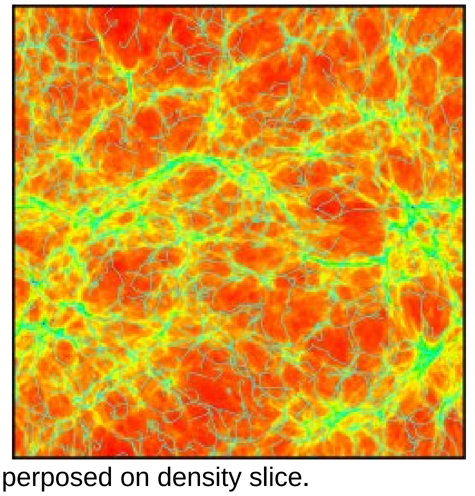
- 3D-skeleton-low-res (at low resolution) and
- 3D-skeleton-hi-res (at higher resolution).

- Skeleton of stars @ z=4



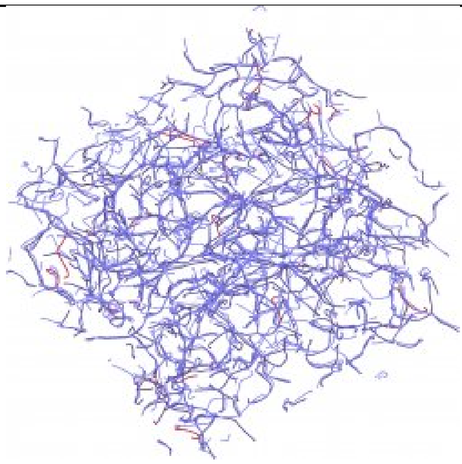
star skeleton @ z=4 note that the smoothing scales are twice those of

- Skeleton of -Div V of gaz @ z=4



Skeleton slice of div V @ z=4 superposed on density slice.

- Comparison of all skeletons @ z=4

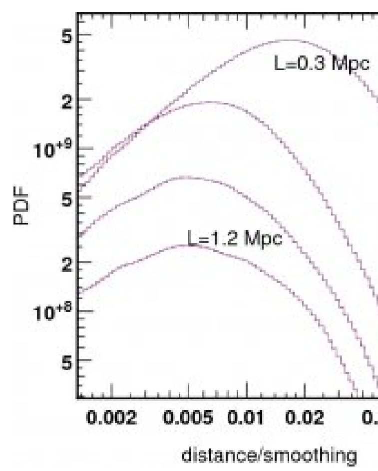


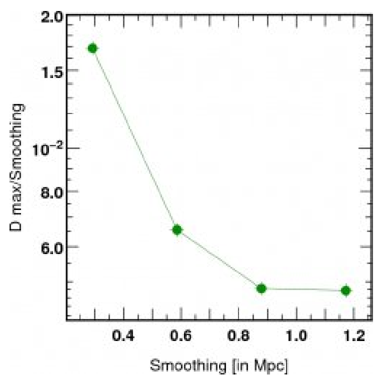
Comparison of all skeleton @z=4 in red DM, in dark blue Gaz and light blue stars

comparison div V vz gaz @ z=4 Note the close similarity between the two skeletons

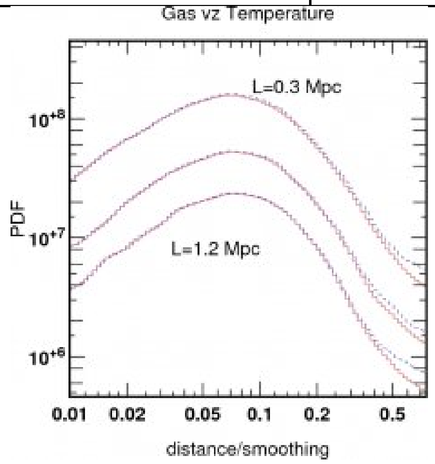
- Distance PDF between gas and DM filaments in units of smoothing.

The physical size of gas filaments appears here @ R



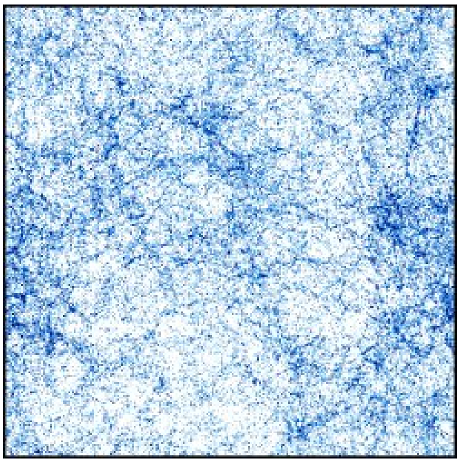


PDF normalised distance Gas-DM @ z=4 for the dark matter the beheaviour is not scale invariant: at about 800 kpc the filaments of DM and Gas differ	Evolution of mode gas-DM distance vz smoothing @ z=4 note the change in beheaviour @ z=4



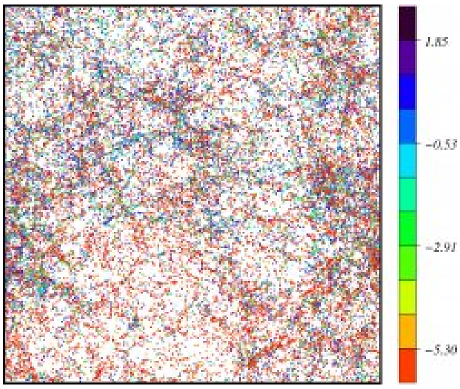
PDF normalised distance Gas-Temperature @ z=4 contrary to the dark matter the beheaviour remains scale invariant

- Stars @ z=4



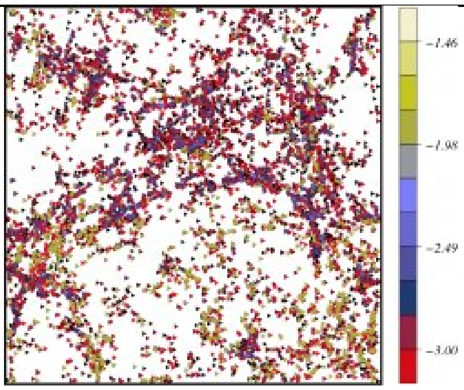
MN stars @ z=4 Note that dead stars (debris are also included)

- Stars age formation @ z=4



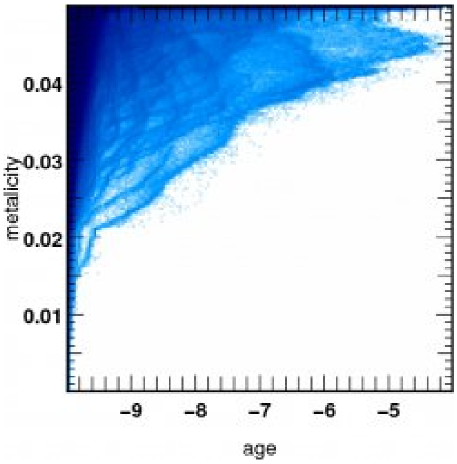
age of star formation @ z=4 The colour coding corresponds to -log conformal age of formation for one star out of 200.

- Star metallicity slice @ z=4



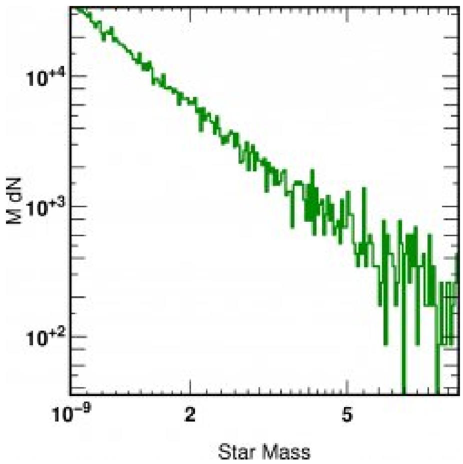
metallicity slice @ z=4 The slice corresponds to 10 % of the cube. The colour coding is log10(10-3+z)

- Stars age metallicity relation @ z=4



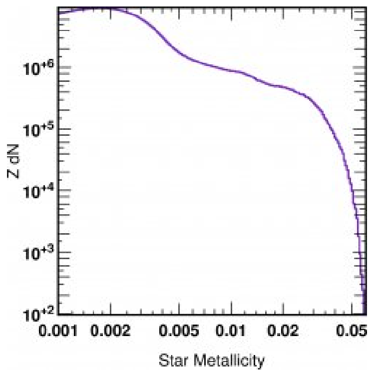
age metalicity relation of stars The redshift z=4

- Mass function of stars @z=4



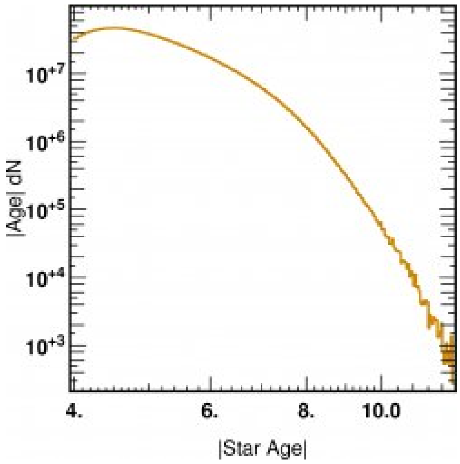
Star Mass function @ z=4 Some random noise was multiplied to the mass in order to carry the PDF.

- Metal PDF of stars @z=4



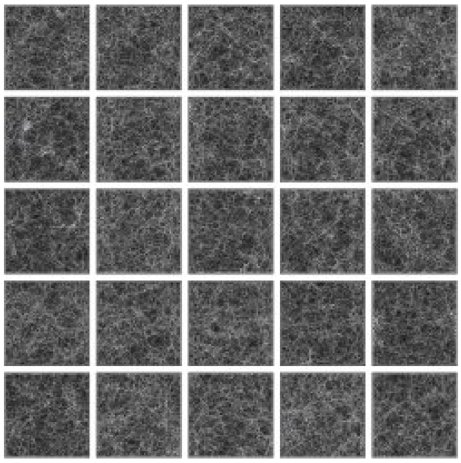
Metal PDF of stars @ z=4

- Age PDF of stars @z=4



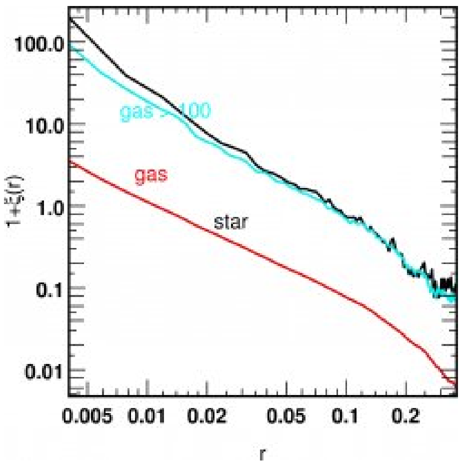
Age PDF of stars @ z=4 in code units (conformal time)

- Slices of Dark Matter @ z=4



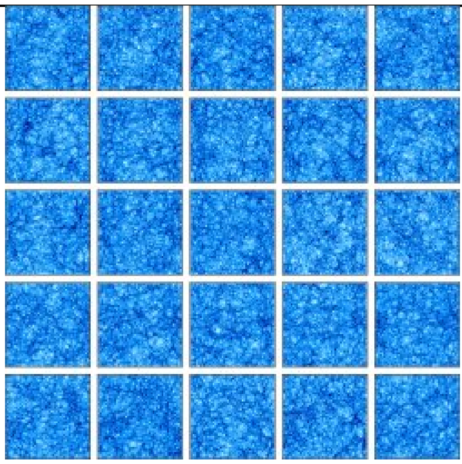
Slices of MN dark matter @ z=4 the resolution is 512x512x512. Each section is taken every 20 pixels in z.

- Correlation function of stars and biased gaz @ z=4
-



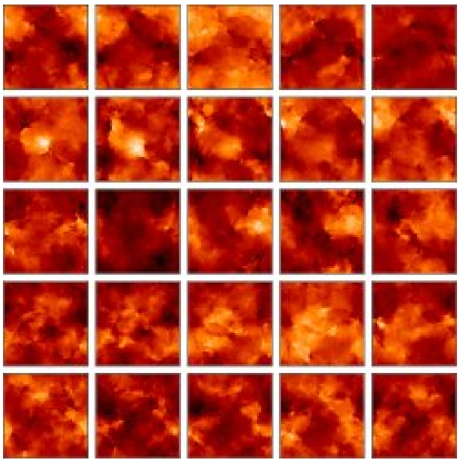
correlation function of stars @z=4 in blue the gaz with contrast larger than 100. in red the gas, in black the stars. Note the bias for the stars.

Slices of gas @ z=4



Slices of MN gas @ z=4 The resolution is 512x512x512. Each section is taken every 20 pixels in z.

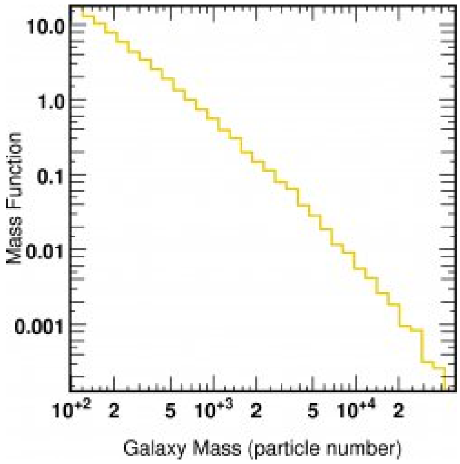
- Slices of gas velocity in z @ z=4



Slices of MN gas velocity @ z=4 The same sampling strategy was applied as previously.

- Mass function of galaxies @ z=4

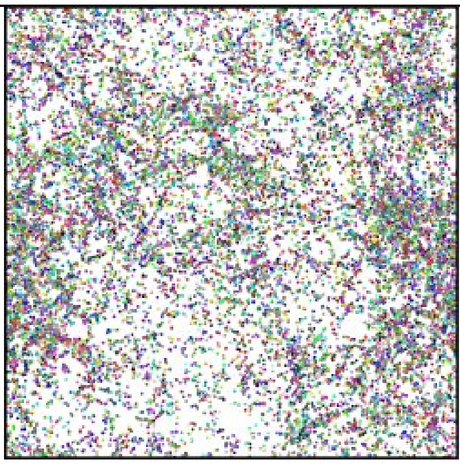
The galaxies are identified via a FOF on the stars



PDF of galaxies @ z=4 note that its not weighted by the different masses of stars

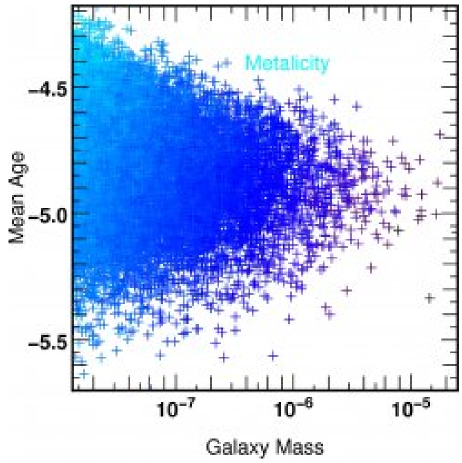
- Spectra of galaxies

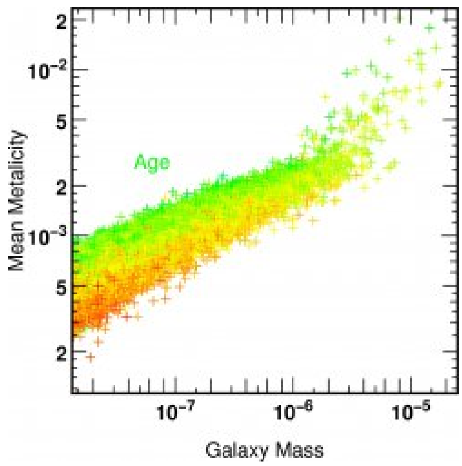
- FOF of galaxies

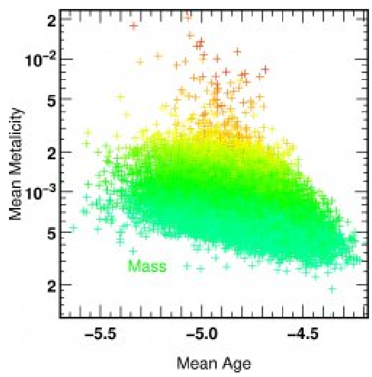


FOF of galaxies @ z=4

- Metallcity age Mass r relations of galaxies @ z=4





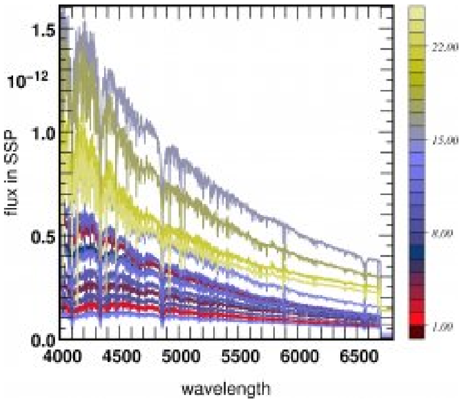


Age mass metalicity of galaxies @ z=4 a FOF cut of 100 was applied on star selection to construct the galaxies. The metalicity and the age are mass weighted	galaxy mass metal @ z=4	galaxies age metal @z=4

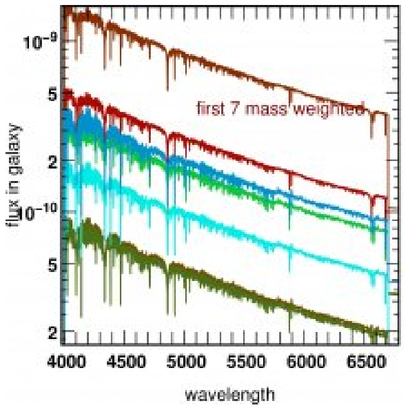
- Catalog

Catalog of galaxies index position number of stars mass age metalicty

- Stellar spectra of galaxies @ z=4

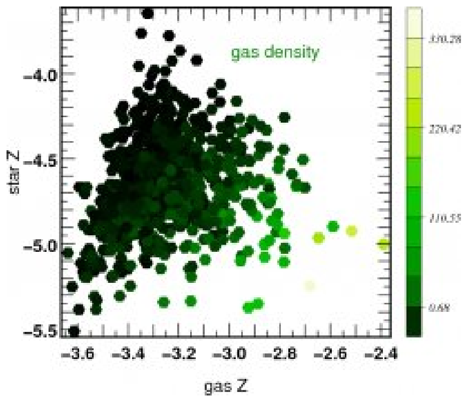


SSP spectra within a given galaxy. The spectra of the SSP entering a given galaxy of MN @ z=4 Here the age and metalicity are not calibrated properly.

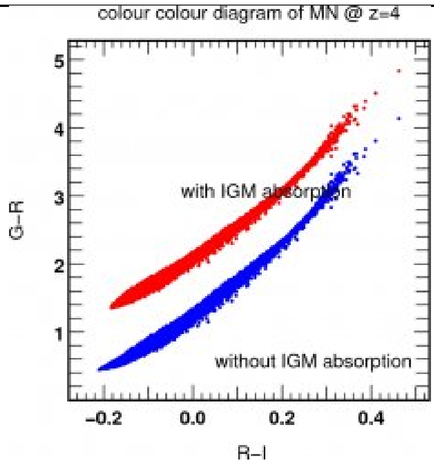


The first few spectra of galaxies @ z=4 The spectra are built according to the distribution of stars as SSP in age metalicity and weighted according to their mass. CAVEAT here the age and metalicity are not calibrated properly.

- metal vz metal of galaxies @ z=4



gaz Z vz star Z @ z=4 The metalicity of stars (mass weighted) vz the metallicity of gas (density weighted) for the first 2000 galaxies containing more than 30 stars. Note that the density/metallicity is measured from the 512^3 cube.



colour colour diagram MN @z=4 Using steidel s colours in order to identify dropouts

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