

# **Simulations Documentation**

the AWESOME Project  
PART: r256 Simulations

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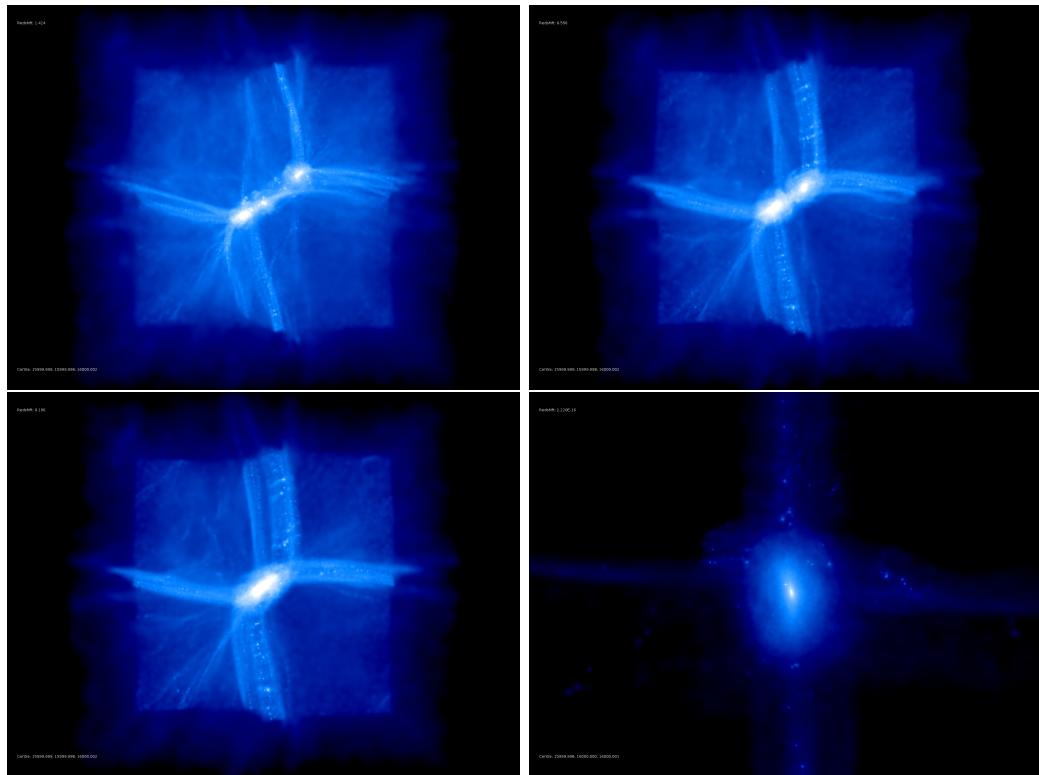
# Chapter 1

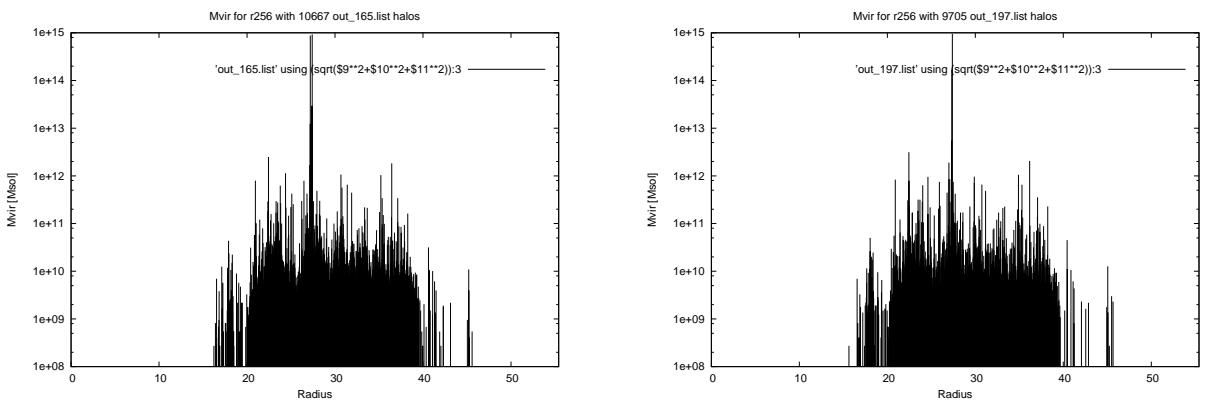
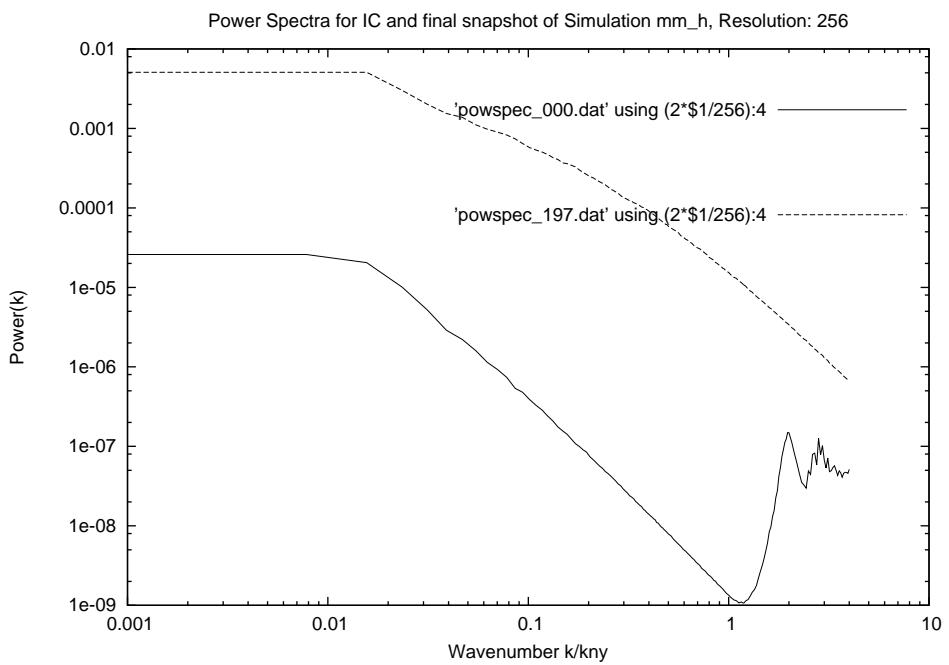
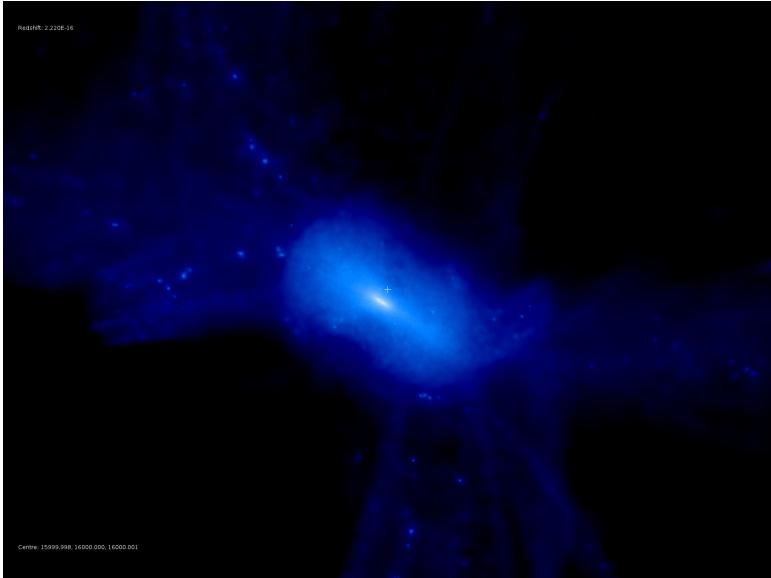
## Simulations

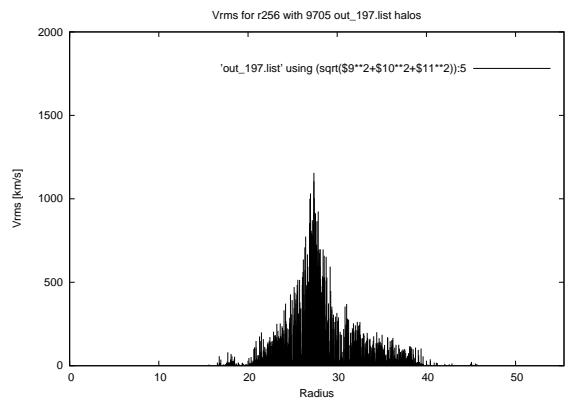
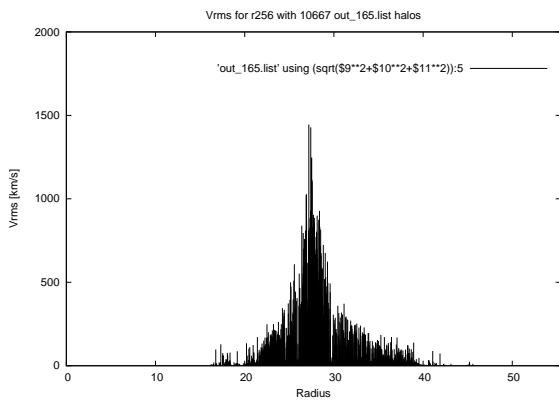
### 1.1 r256

#### 1.1.1 h70

mm\_h (major merger H comparison)



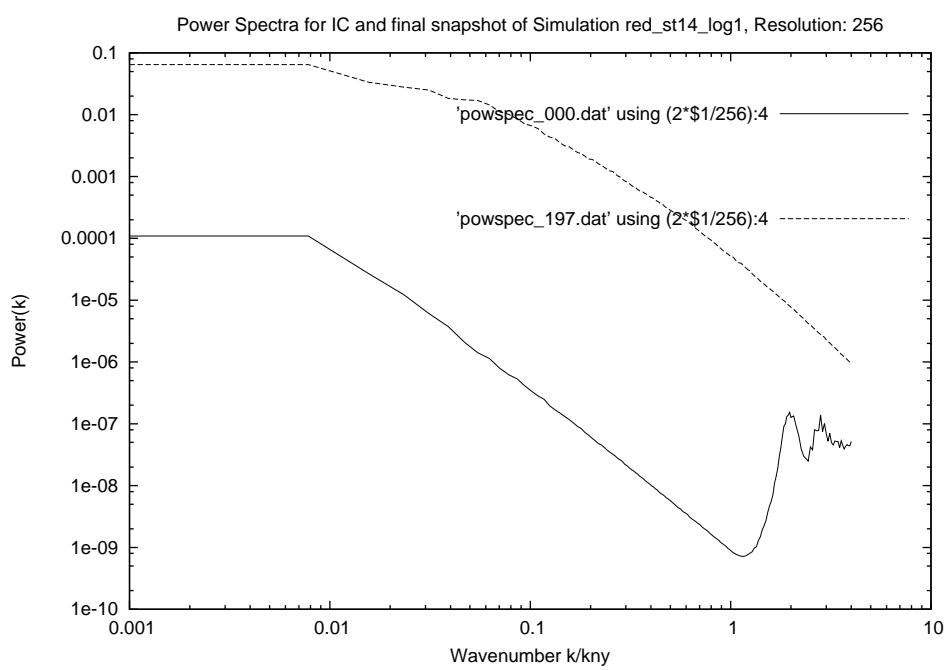
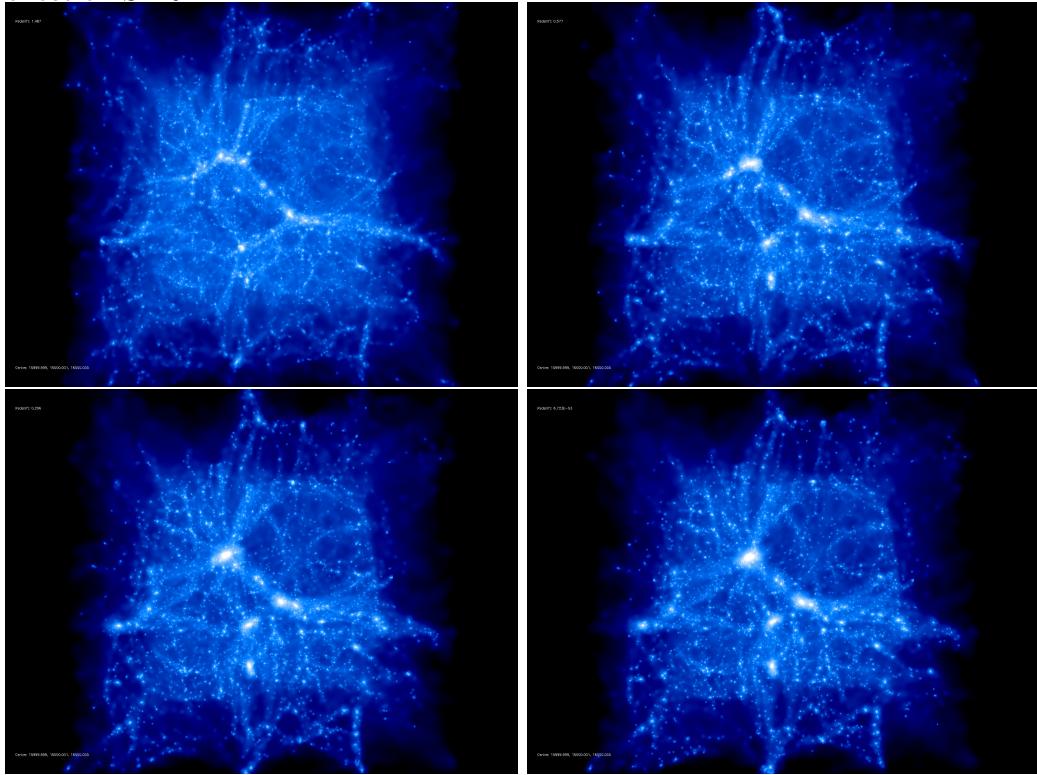


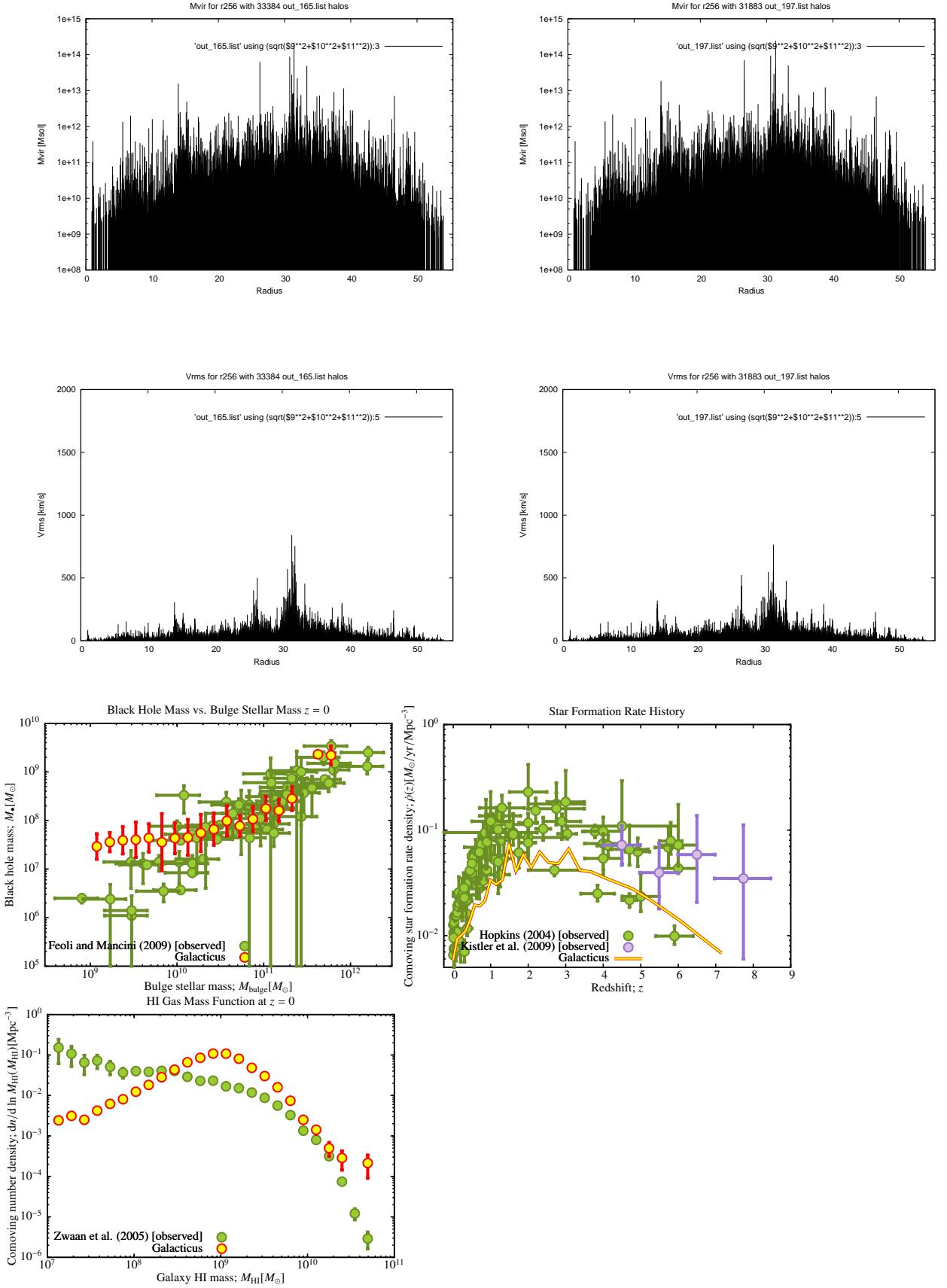


GALACTICUSSED ✓  
CONSISTENTTREEDE ✓  
ROCKSTARRED ✓

**red\_st14\_log1**

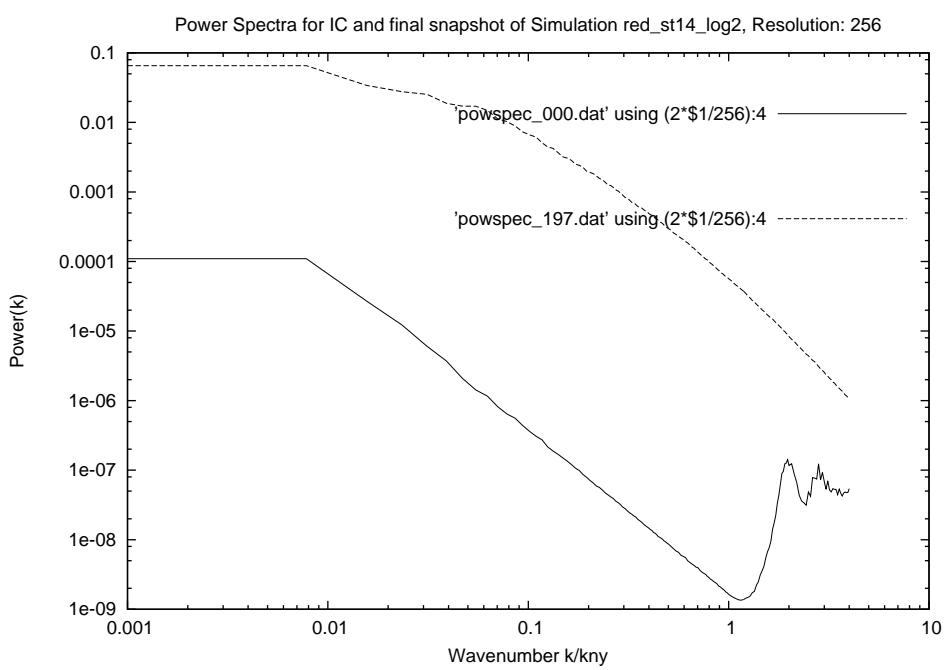
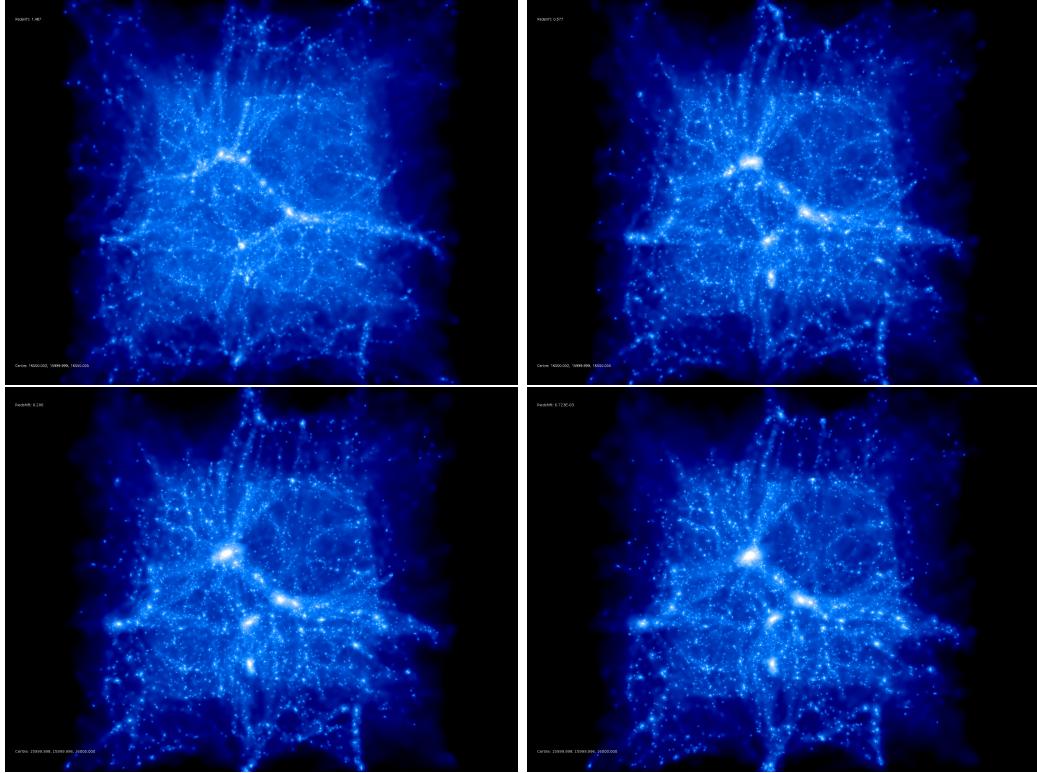
stages\_14 constraints + seed resimulated with different linger.dat in order to test its effect on SFR.

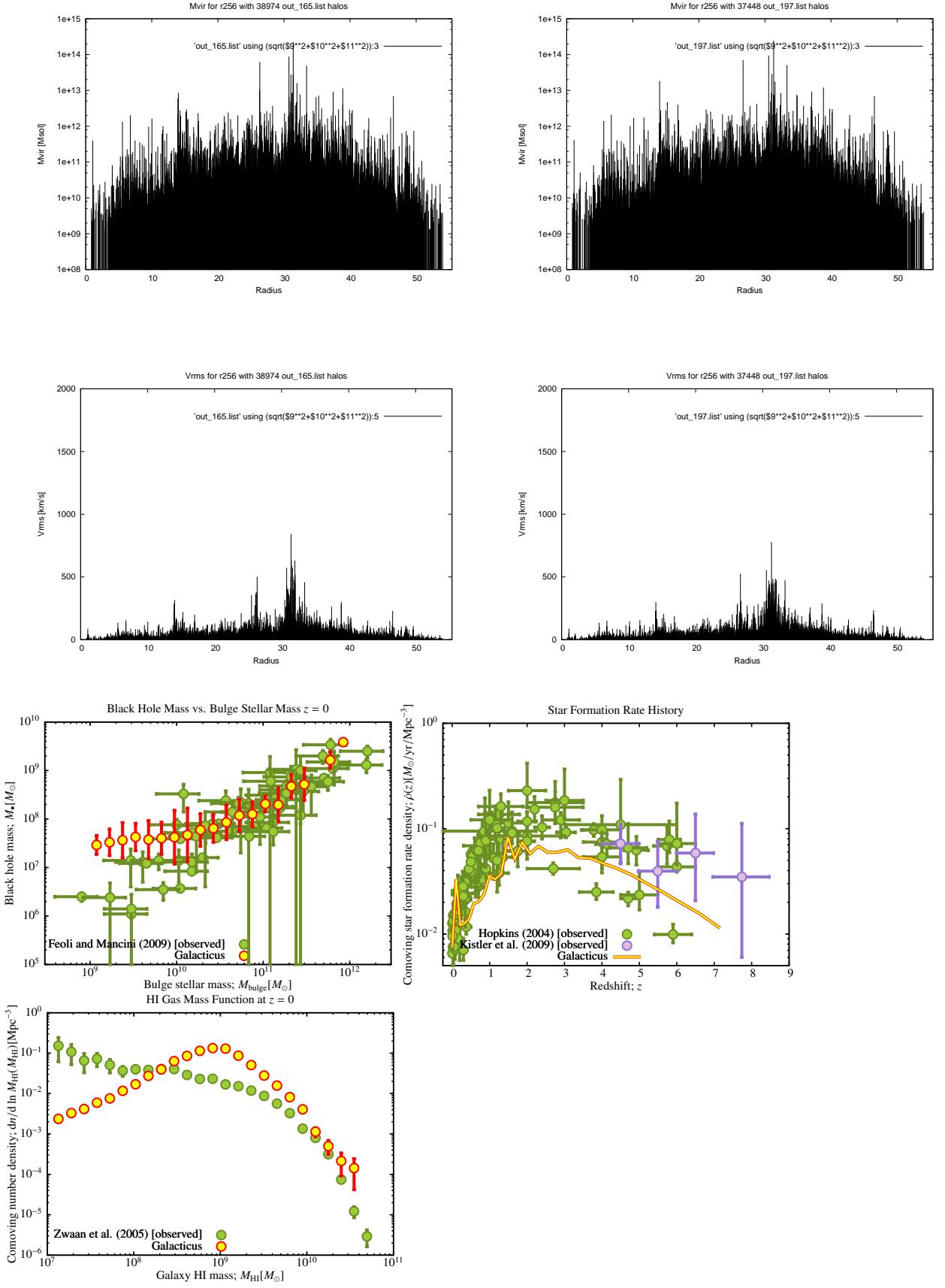




**red\_st14\_log2**

`stages_14` constraints + seed resimulated with different `linger.dat` in order to test its effect on SFR.

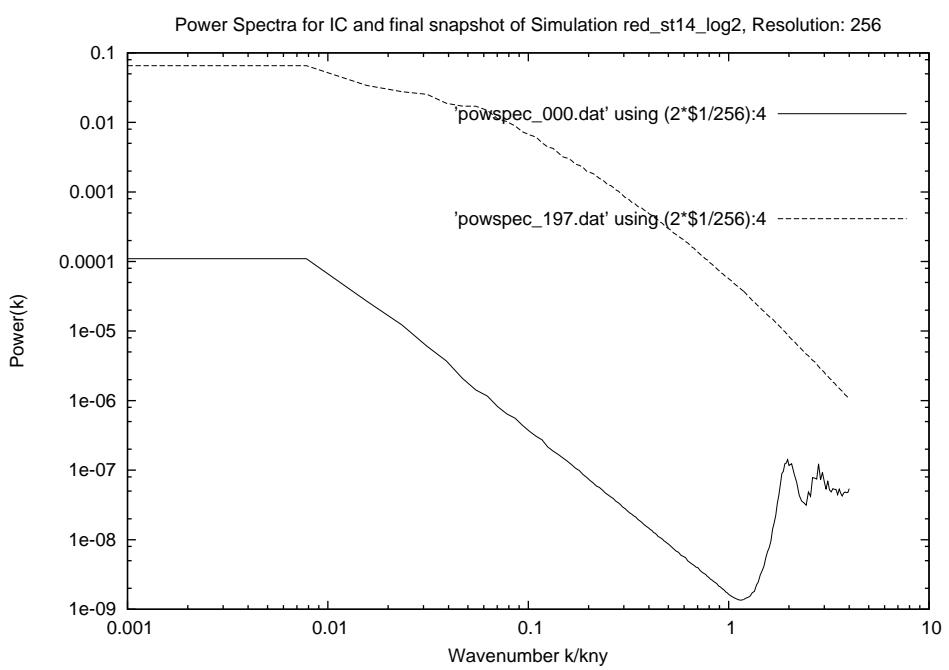
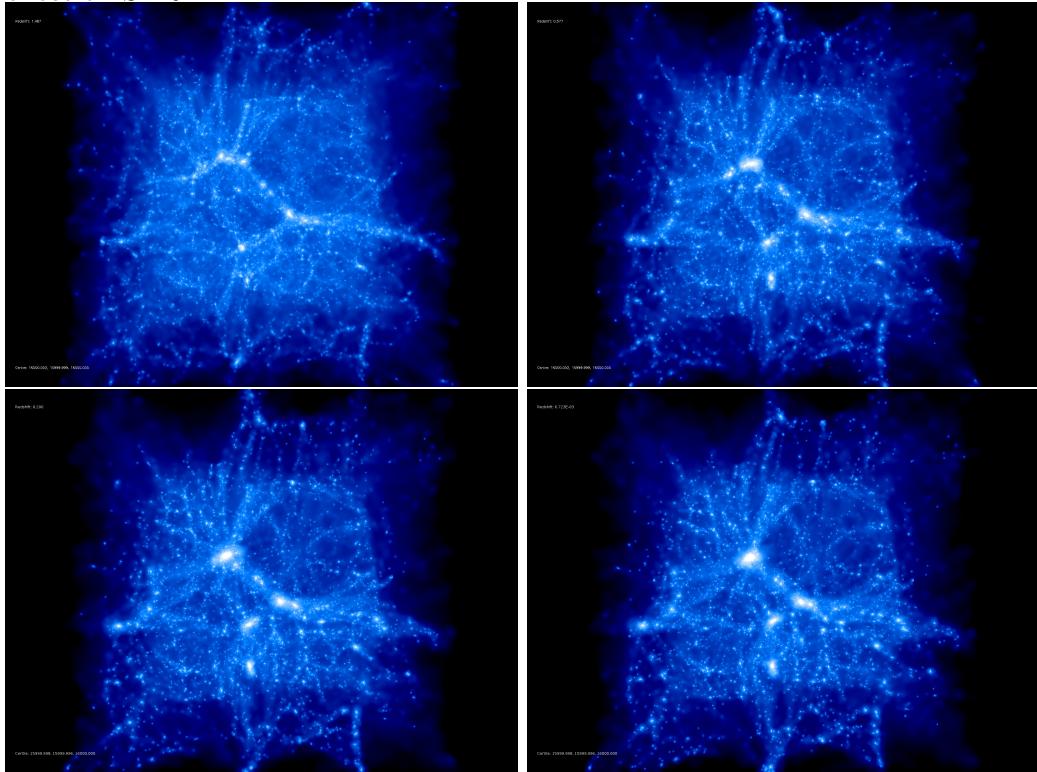


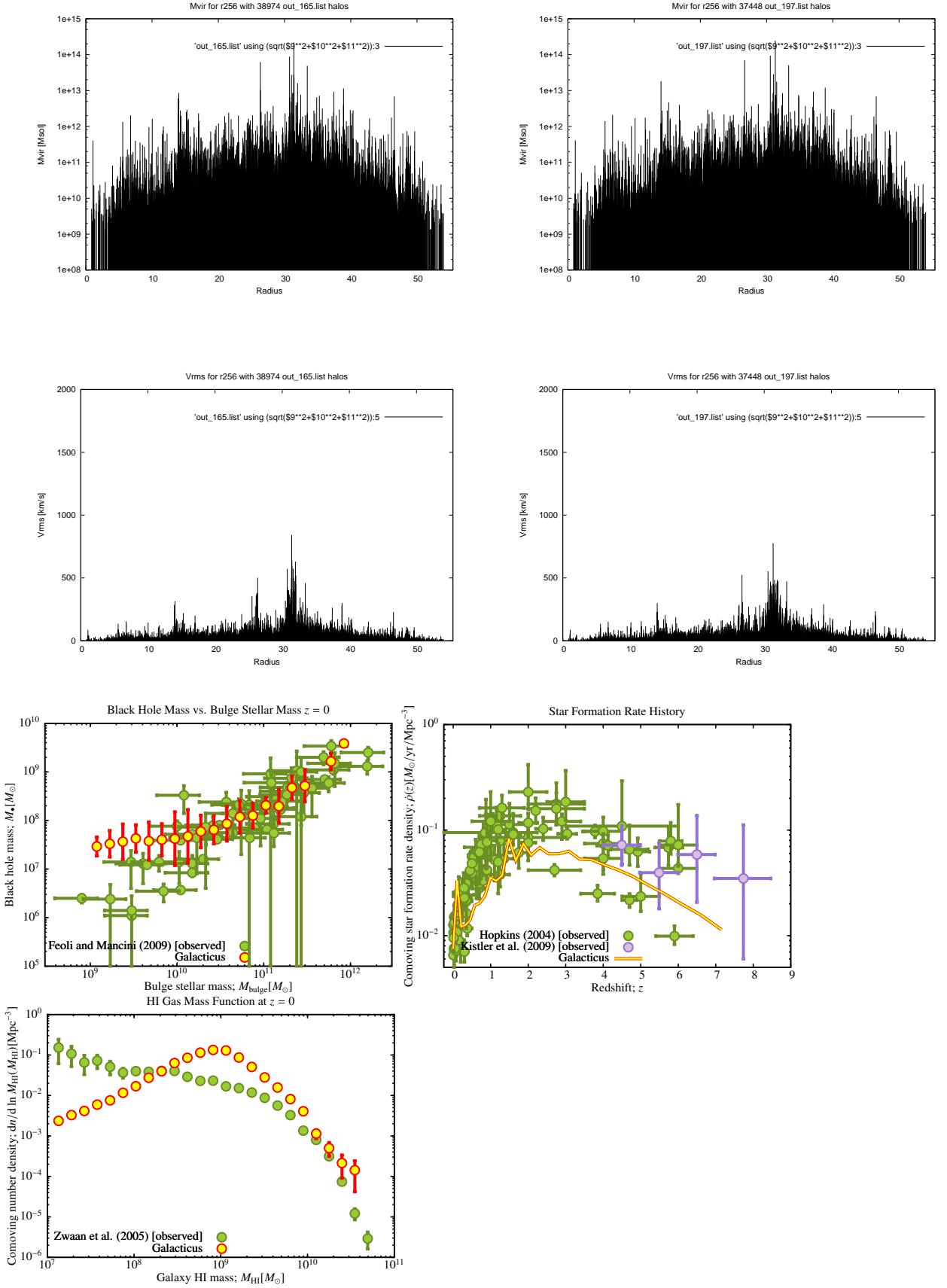


BEING GALACTICUSSED

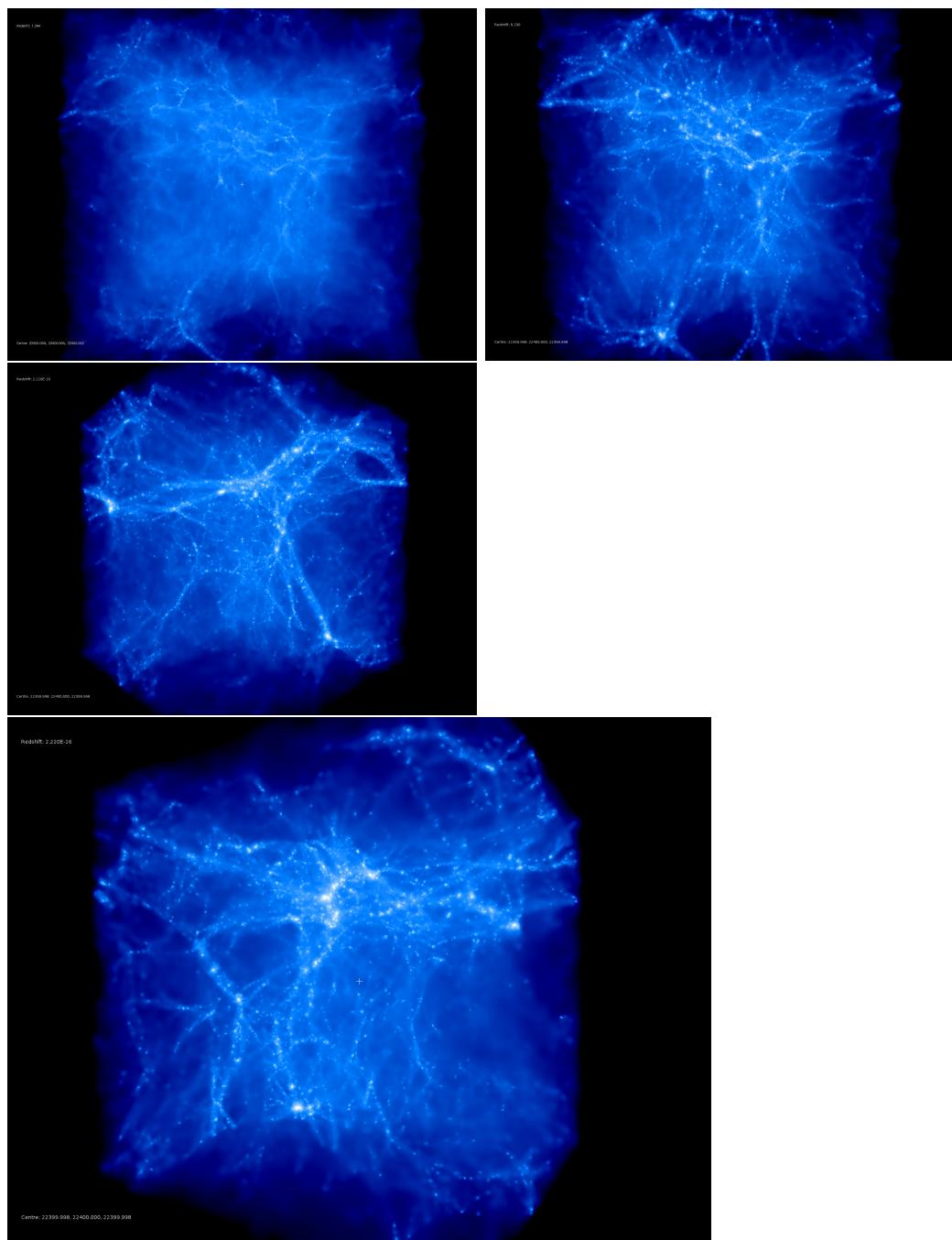
**rst14lg3**

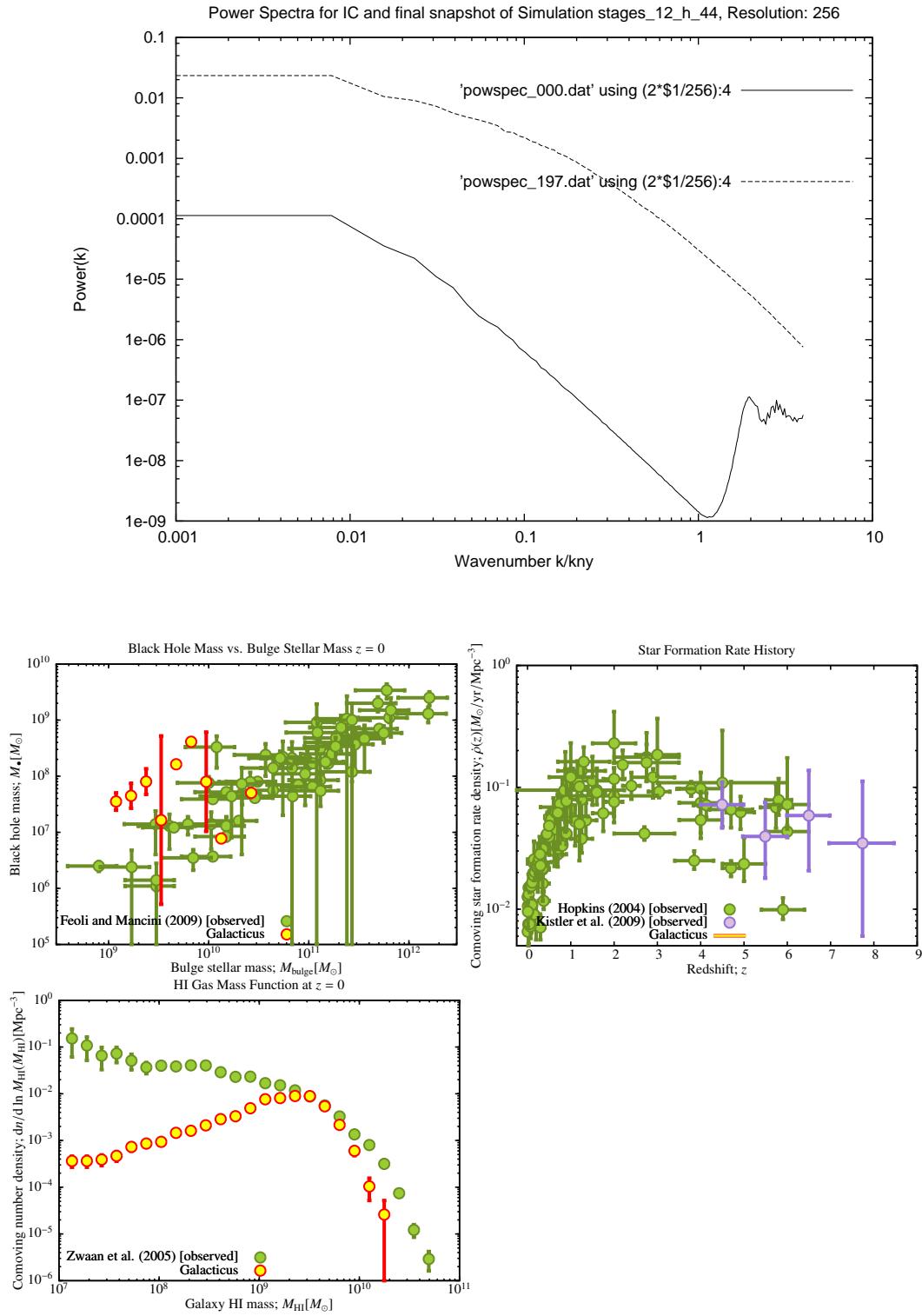
`stages_14` constraints + seed resimulated with different `linger.dat` in order to test its effect on SFR.





stages\_12\_h\_44



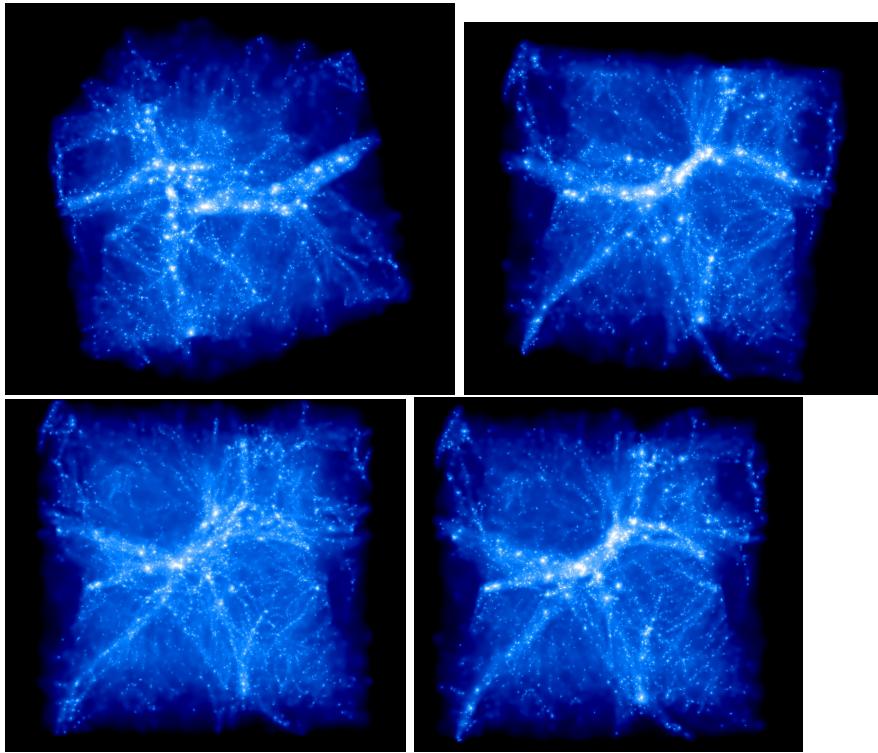


**stages\_20\_h**

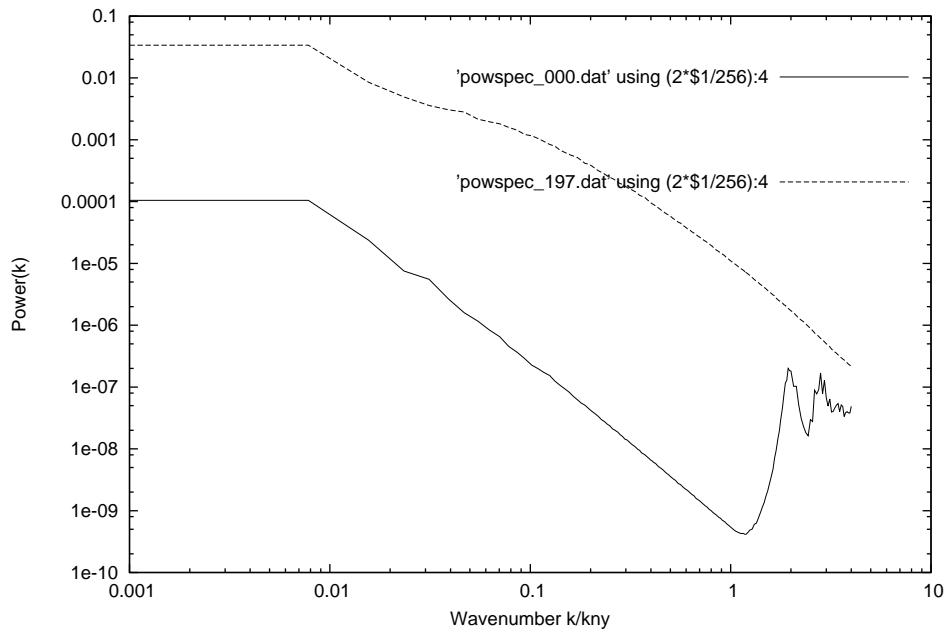
BEING ROCKSTARRED

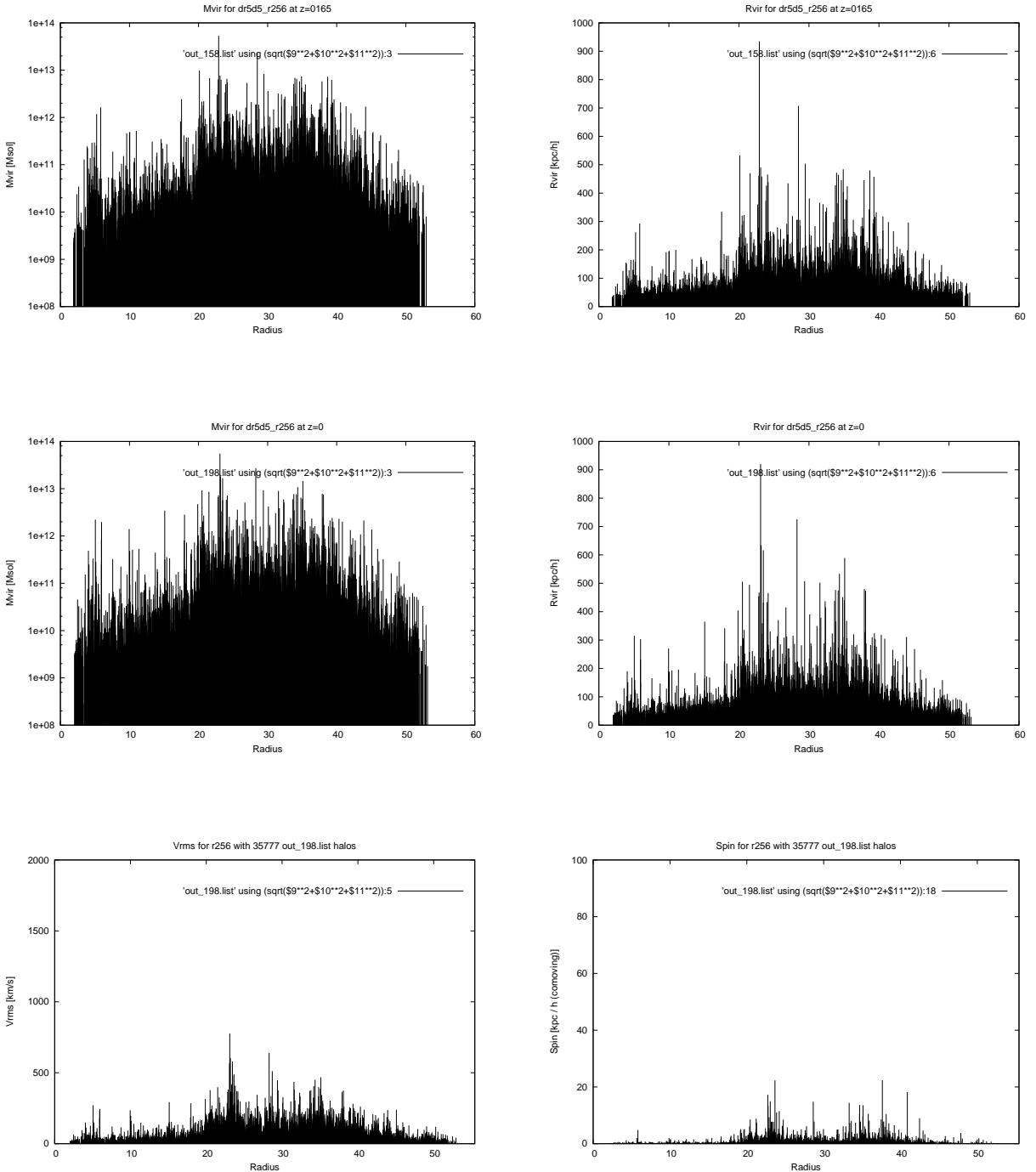
### 1.1.2 h100

**dr5d5\_r256**



Power Spectra for IC and final snapshot of Simulation dr5d5\_r256, Resolution: 256





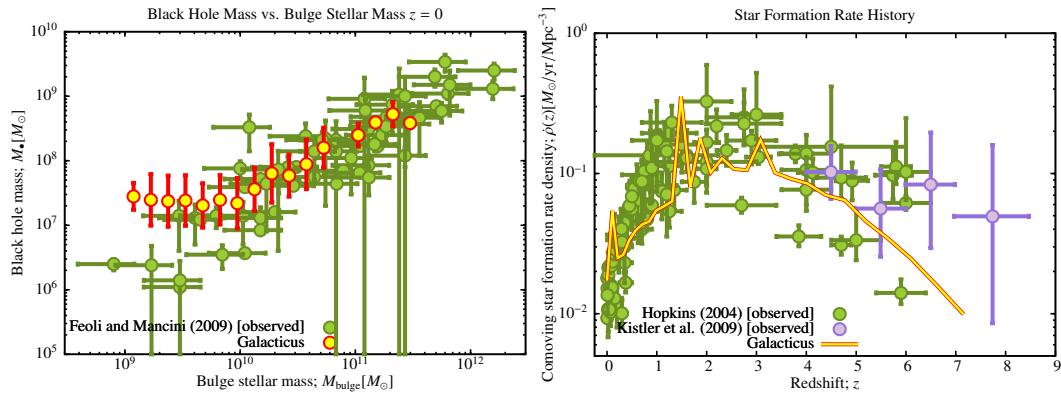
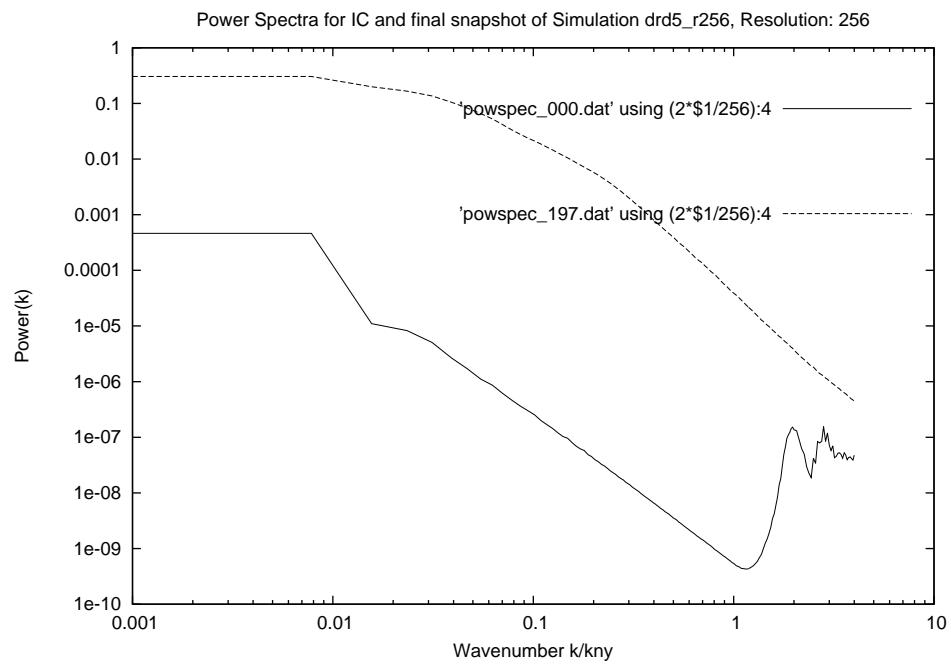
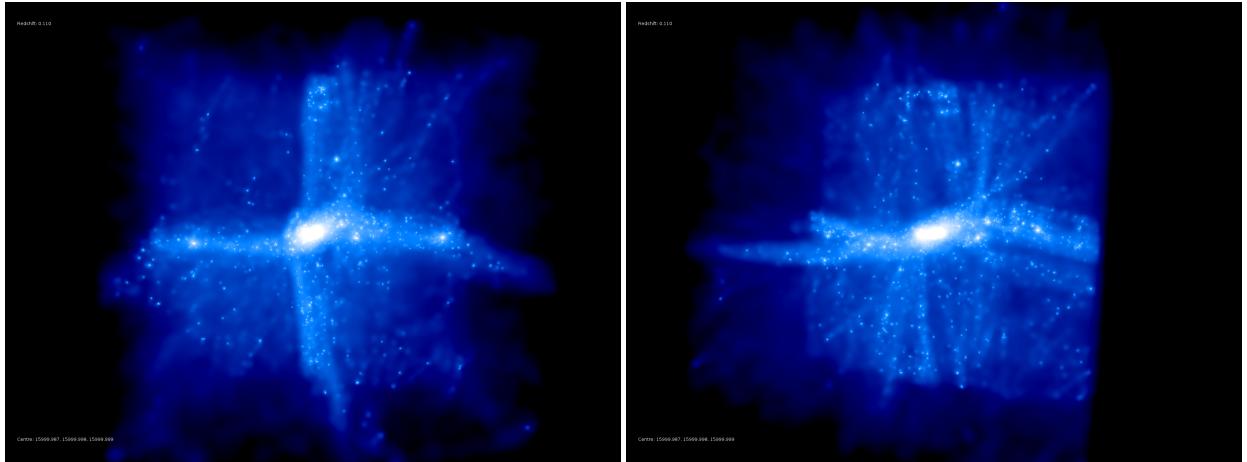
is being galacticussed  
 CONSISTENTTREED ✓  
 ROCKSTARRED ✓  
 → re-rockstar on AMD ...-03

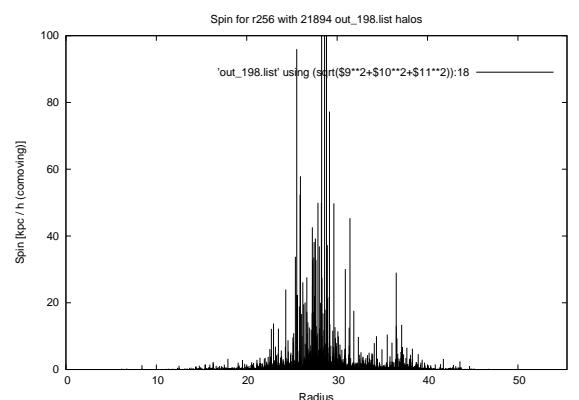
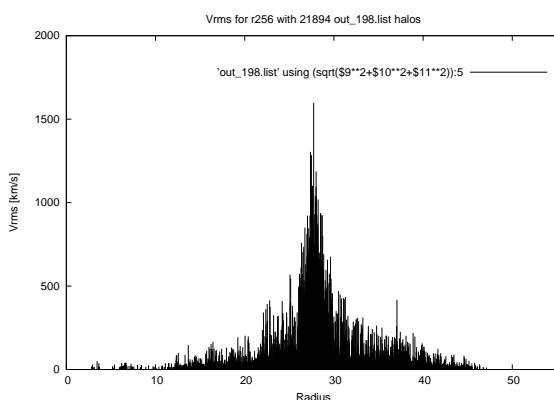
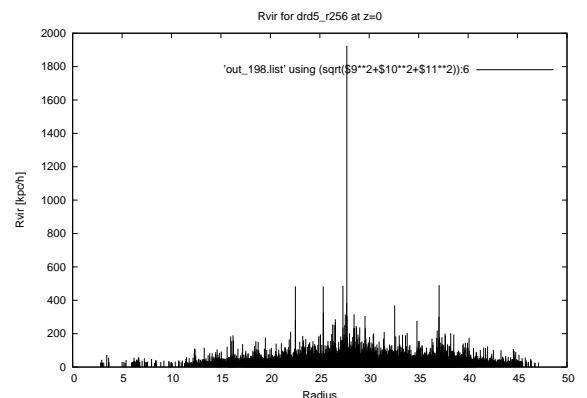
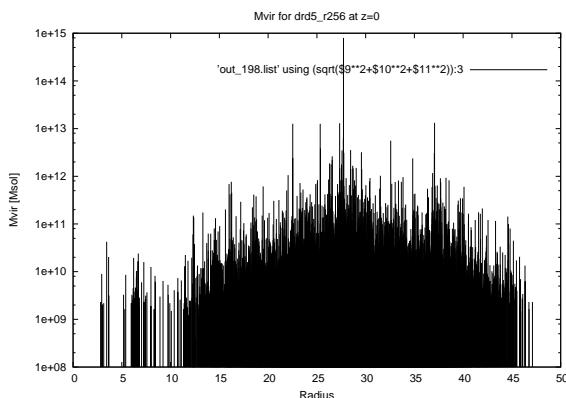
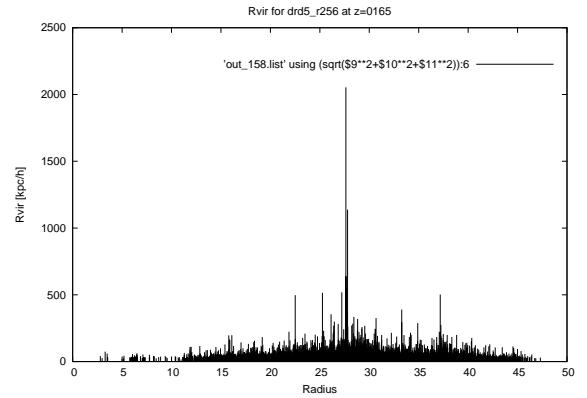
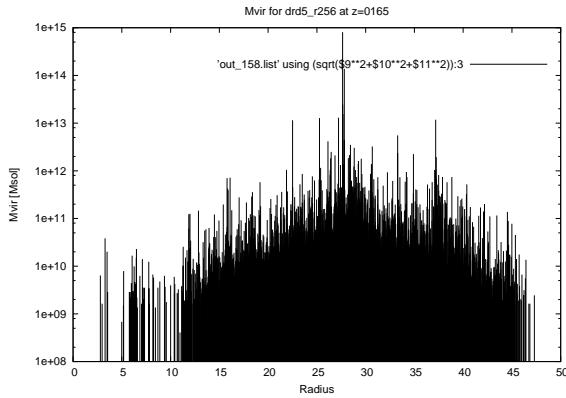
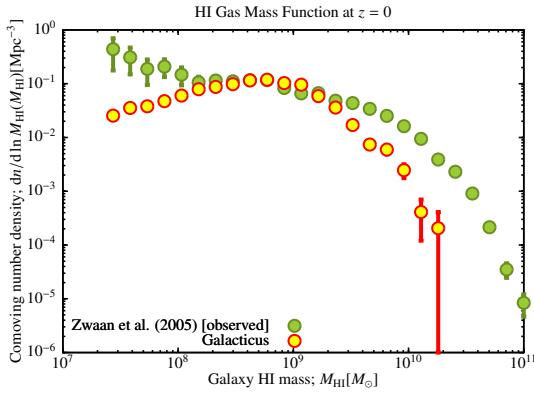
```
find_parents_and_cleanup.c:130:  

lookup_new_id: Assertion `new_id' failed.
```

is being consistentreed

`drd5_r256 (~)`





GALACTICUSSED ✓

galacticus running on SGE

→ re-converted with bugfixed converter

tree copied to markus transfer

GALACTICUS:

```
Fatal error in Build_Descendent\_Pointers():
```

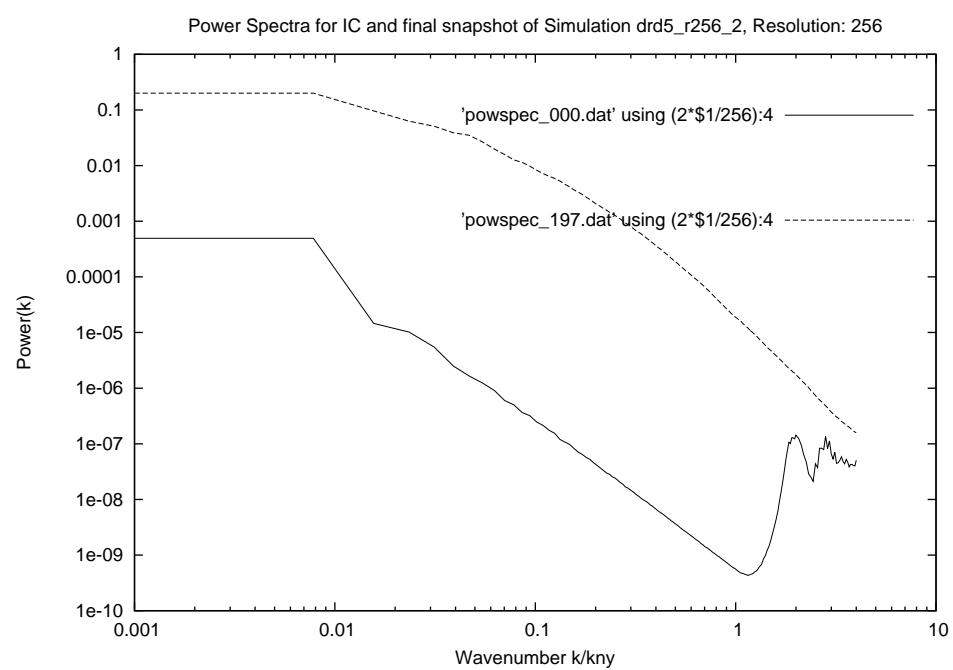
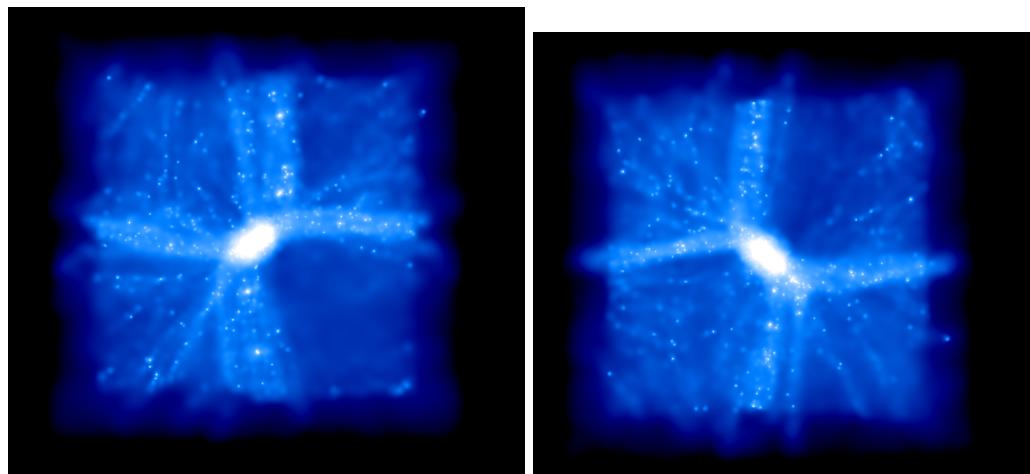
```
failed to find descendant node: 5546454 of 5522259
```

```
galacticus.sh: line 67: 25689 Aborted
```

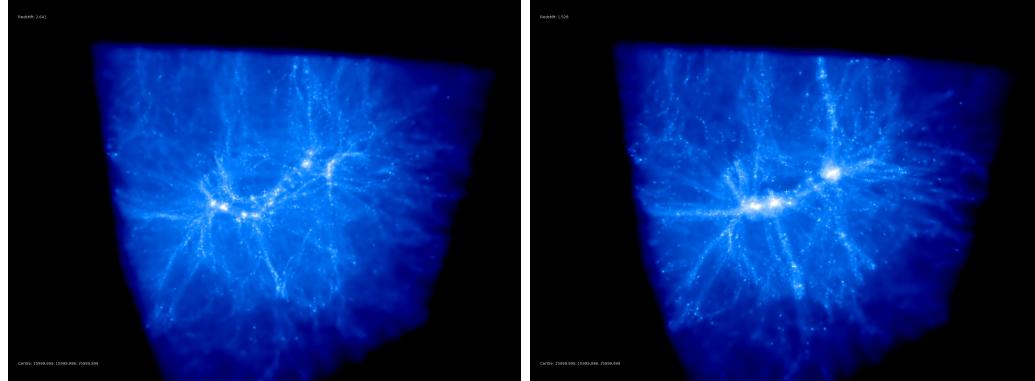
CONSISTENTTREEED ✓

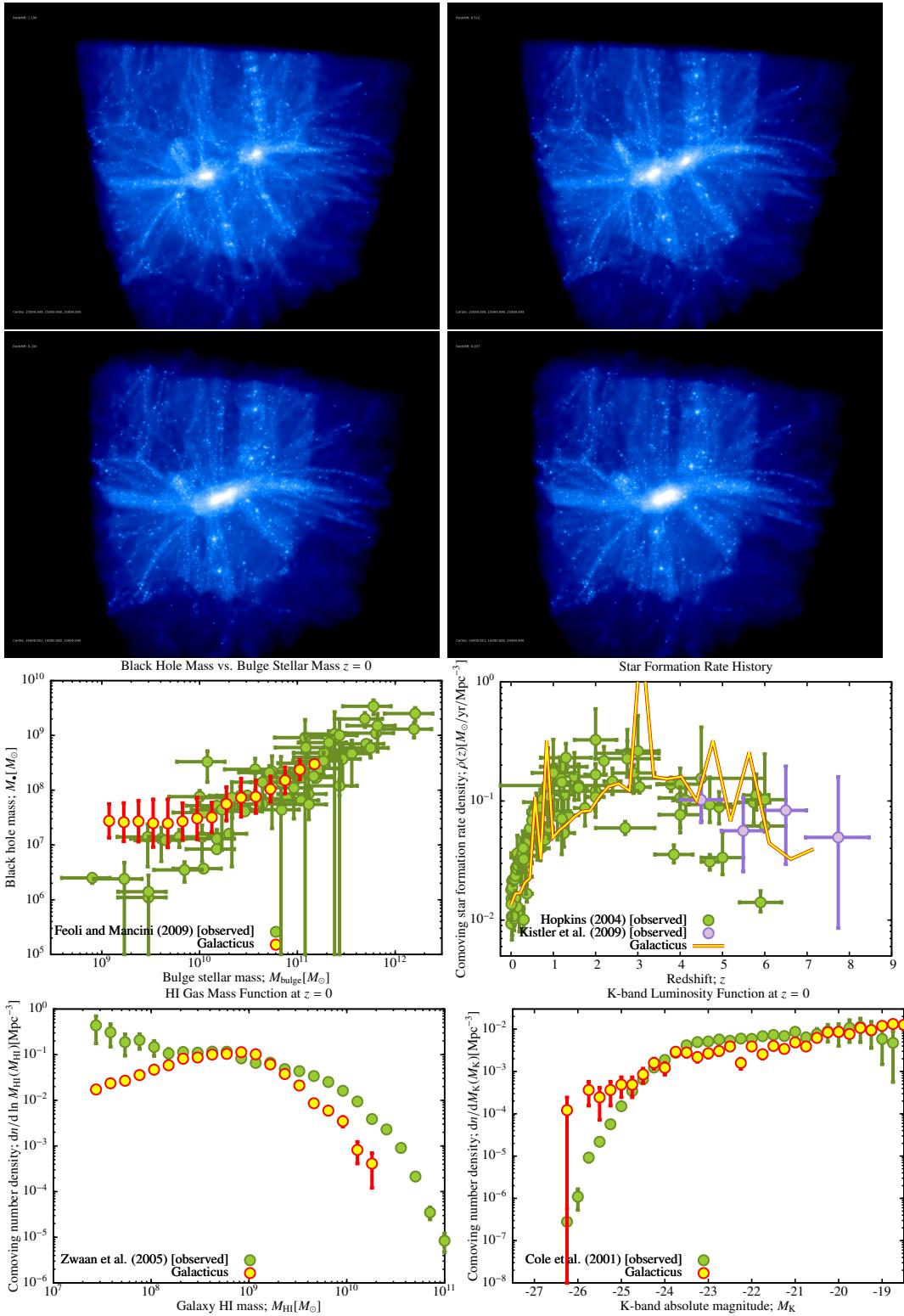
ROCKSTARRED ✓

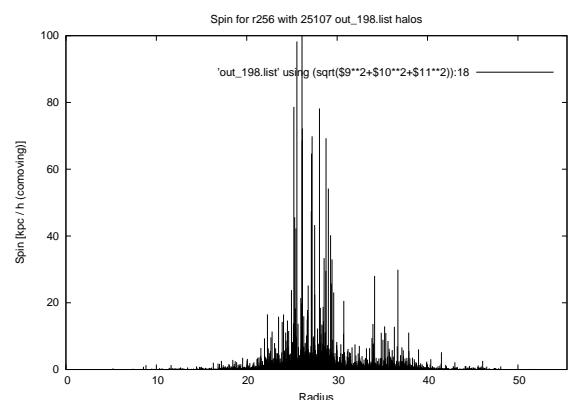
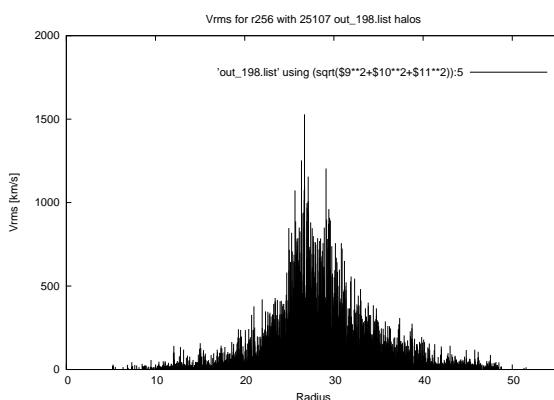
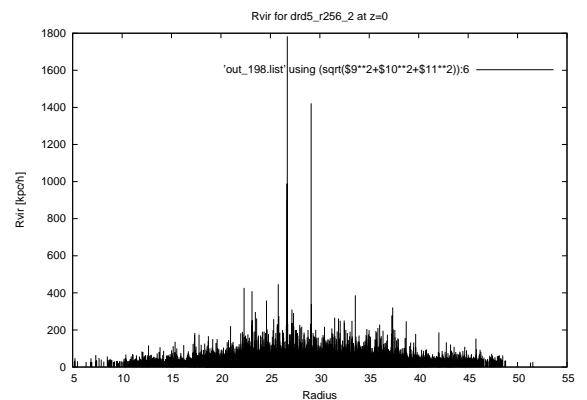
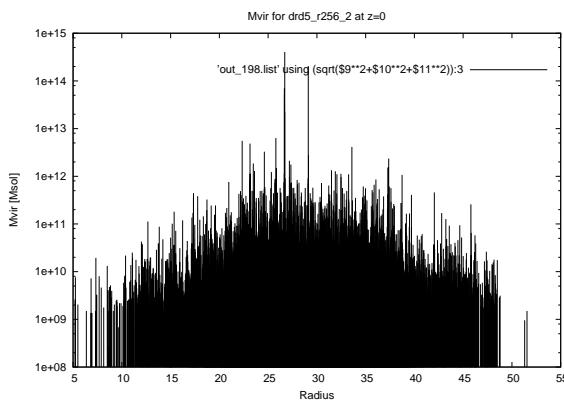
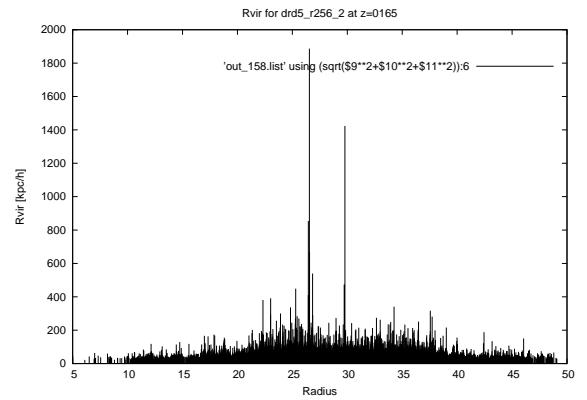
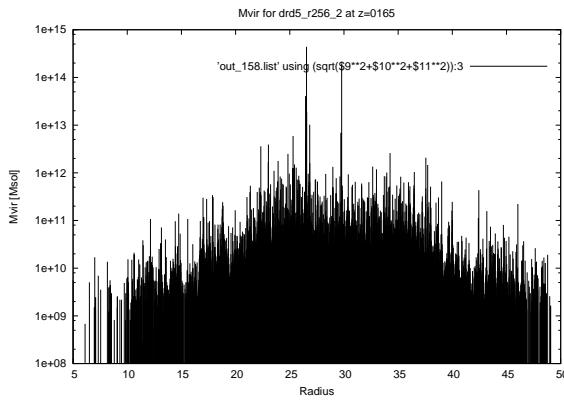
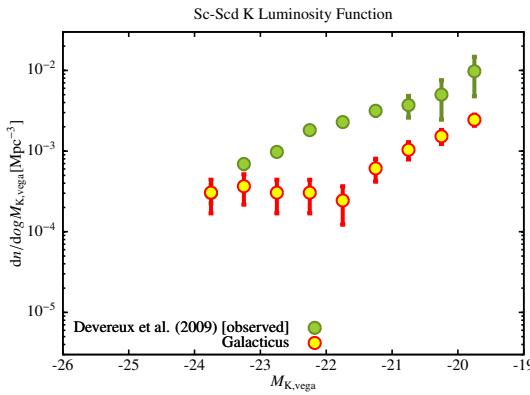
drd5\_r256\_2 (+ major merger in progress)



Evolution:





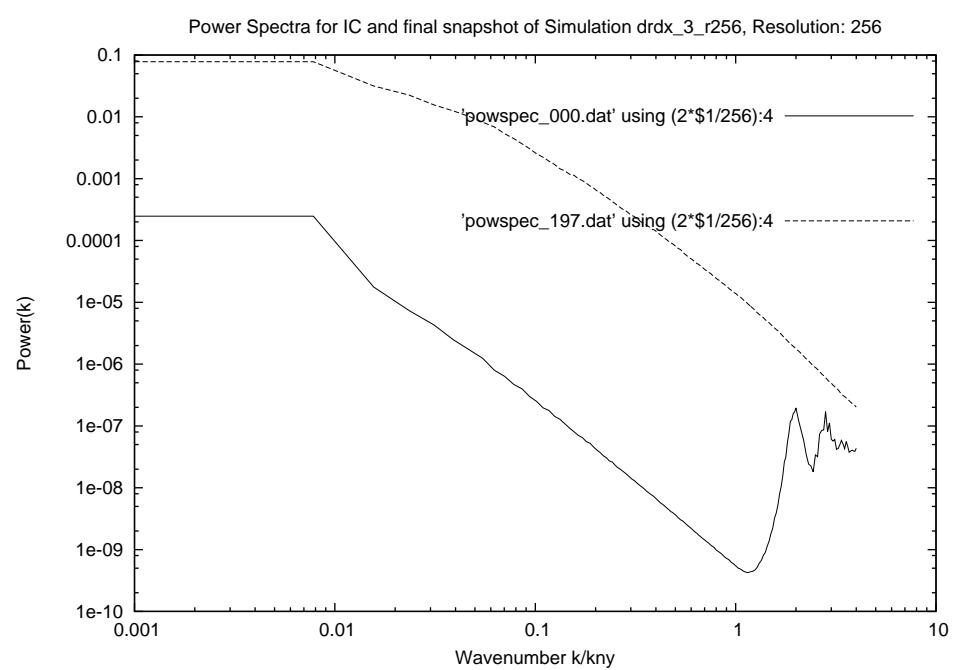
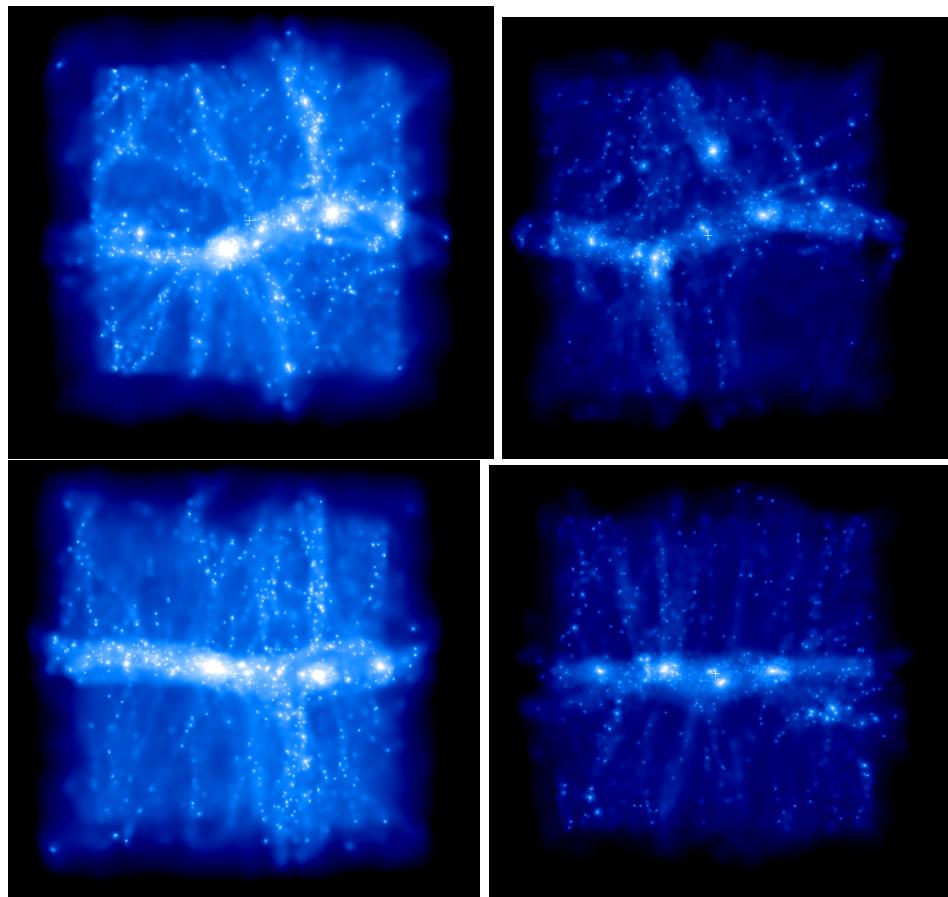


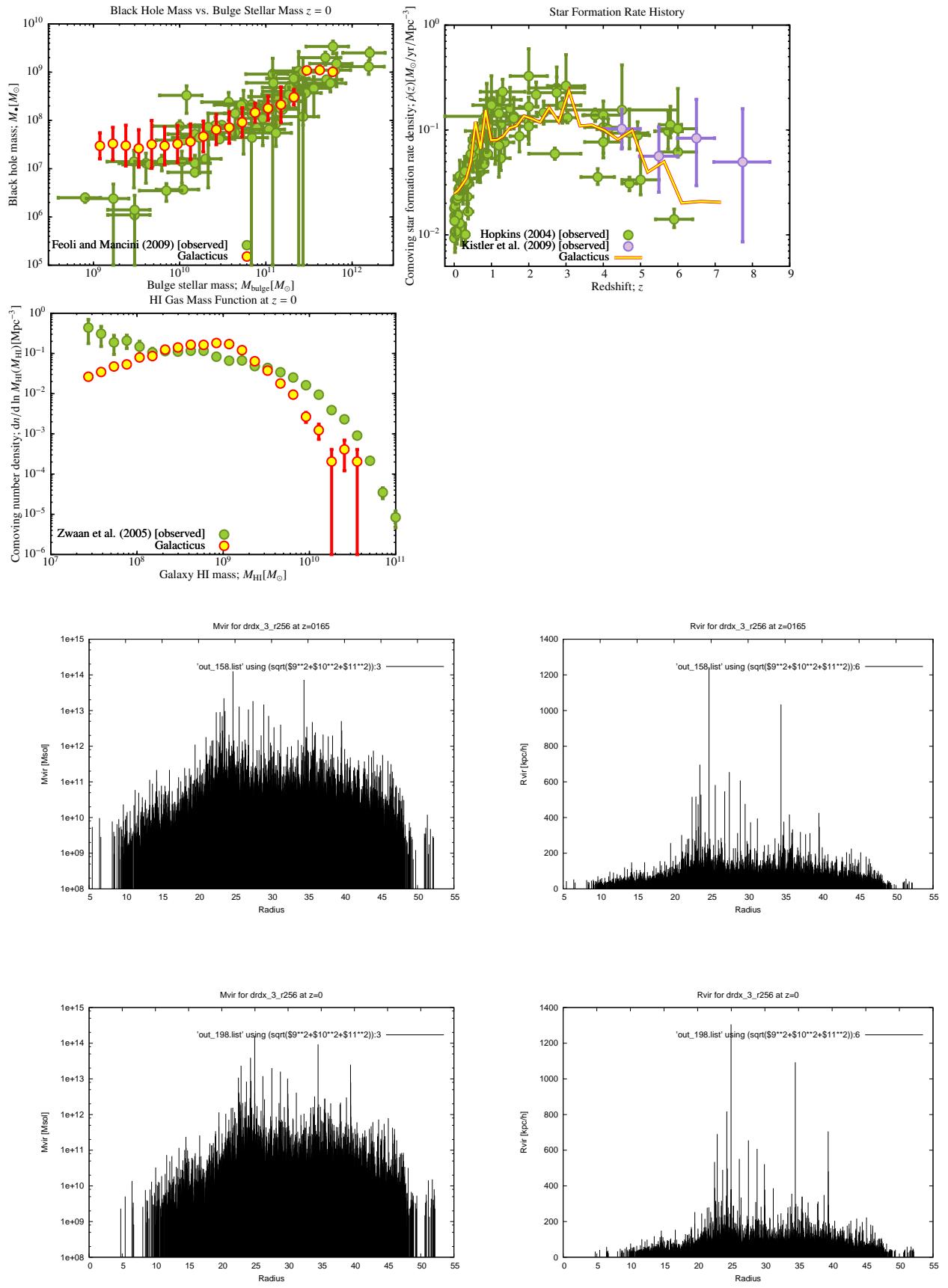
GALACTICUSSED ✓  
→ fixed in revision 709  
→ not fixed! E-Mail to Andrew  
After fix in rev. 708 → is being re-galacticussed  
→ DUMP IT ?  
→ gadgetviewer: simulation has "artificial" cross galacticus running on SGE  
→ re-converted with bugfixed converter (v0.3)  
is being galacticussed → job seems to run!

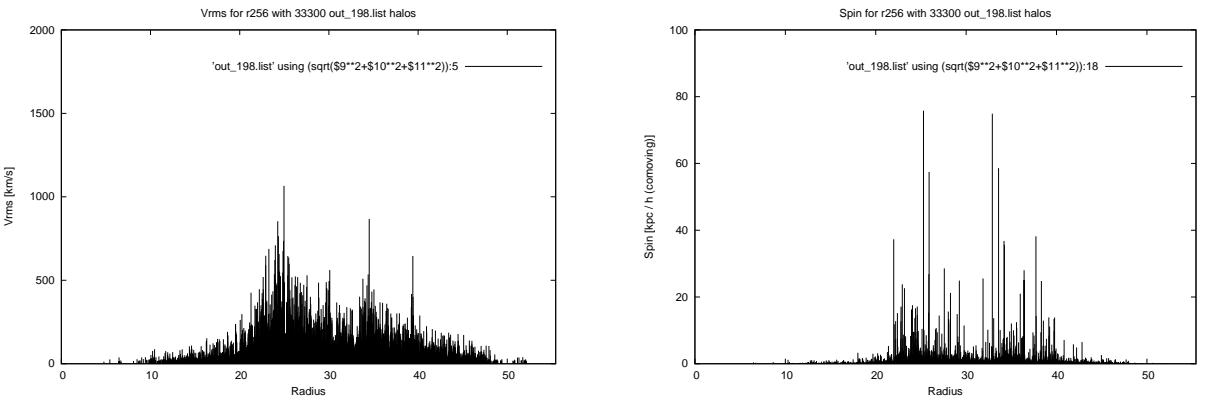
```
no: A fatal error occurred! Backtrace for this error:  
#0 0x2B3F2E65E897  
#1 0x2B3F2E65EE4E  
#2 0x301763648F  
#3 0x487AA0 in __merger_tree_read_MOD_build_descendent_pointers  
#4 0x48ADC3 in __merger_tree_read_MOD_merger_tree_read_do  
#5 0x48205E in __merger_tree_construction_MOD_merger_tree_create  
#6 0x46F469 in __galacticus_tasks_evolve_tree_MOD_galacticus_task_evolve_tree._omp_fn.0  
.F90:0  
#7 0x46F9C4 in __galacticus_tasks_evolve_tree_MOD_galacticus_task_evolve_tree  
#8 0x46FA4F in __galacticus_tasks_MOD_galacticus_task_do  
#9 0x4600E4 in MAIN__ at Galacticus.F90:0
```

CONSISTENTTREEED ✓

ROCKSTARRED ✓ (lasted about 9000minutes)

**drdx\_3\_r256**





GALACTICUSSED ✓  
→ fixed in revision 709

GALACTICUS REV708:

```
#4 0x301763648F
#5 0x49B1B8 in __merger_tree_read_MOD_build_descendent_pointers at merger_trees.construct
#6 0x49FF70 in __merger_tree_read_MOD_merger_tree_read_do at merger_trees.construct.read
#7 0x4923BE in __merger_tree_construction_MOD_merger_tree_create at merger_trees.constr
#8 0x4800C6 in __galacticus_tasks_evolve_tree_MOD_galacticus_task_evolve_tree._omp_fn.0
#9 0x2AC099B4F829
#10 0x3017A07CD0
#11 0x30176DFD3C
#12 0xFFFFFFFFFFFFFF
/sge-root/sge/AMD64/spool/astro13/job_scripts/83594: line 22: 13318 Aborted
```

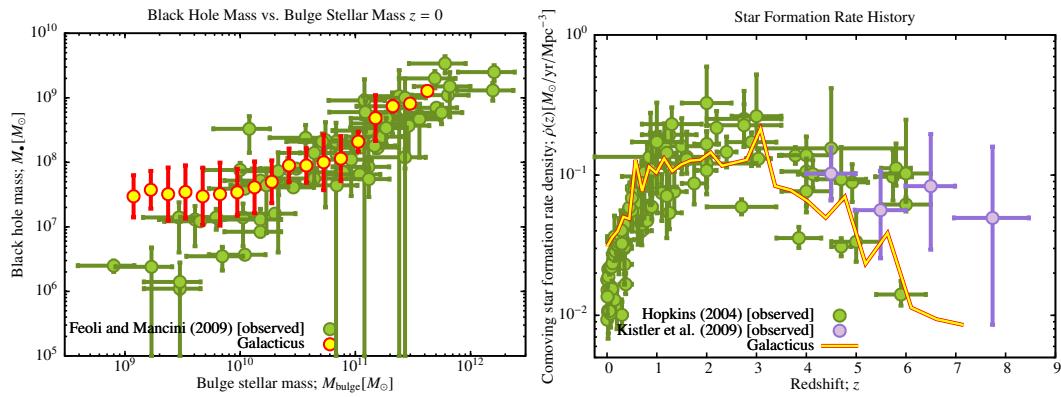
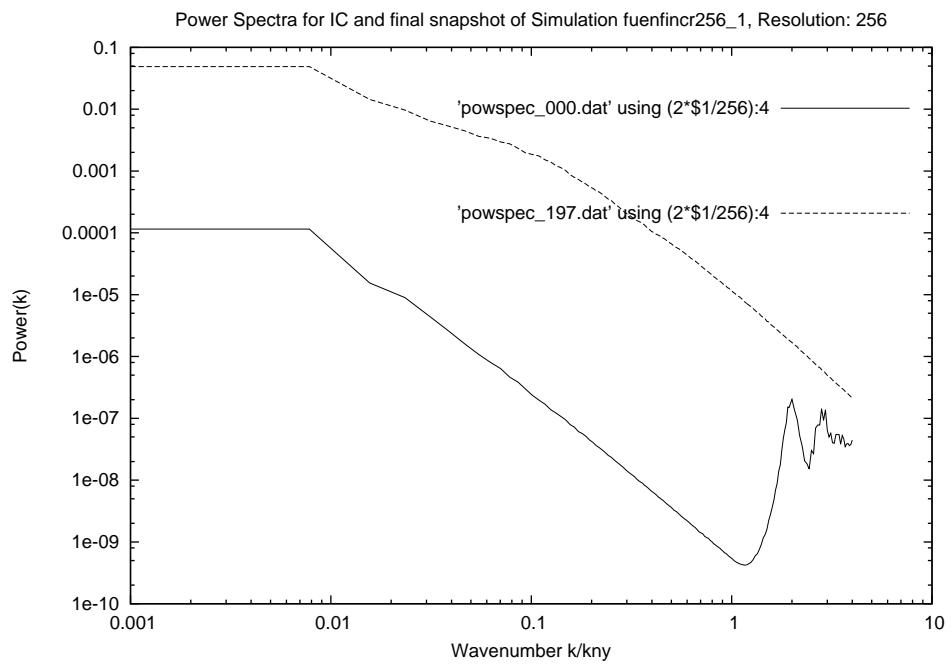
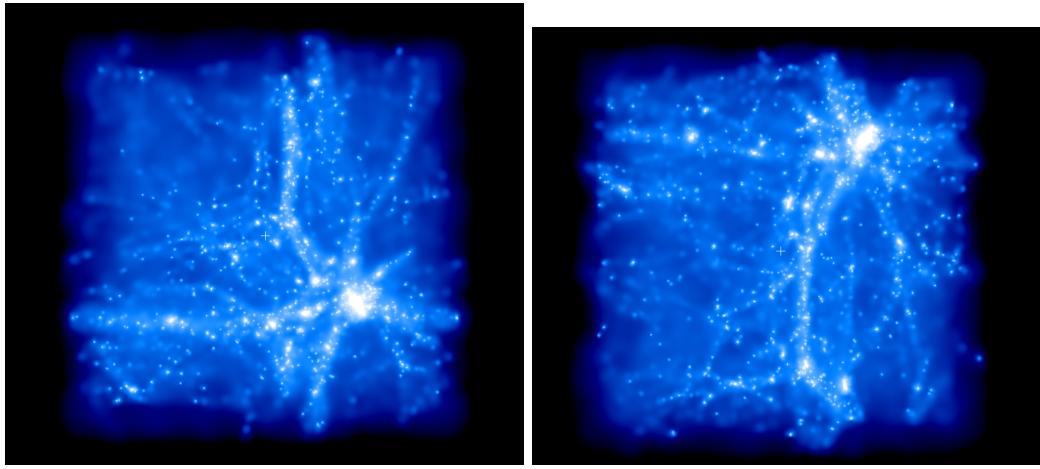
CONSISTENTTREE ✓

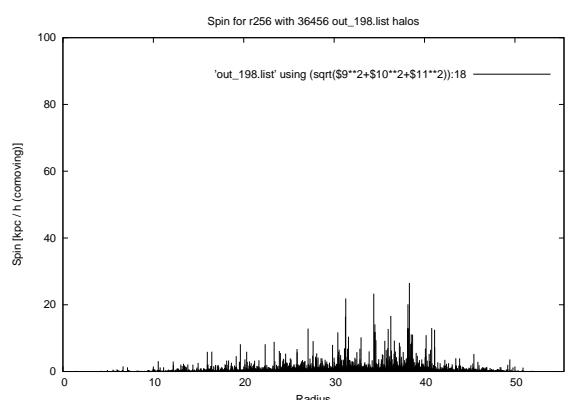
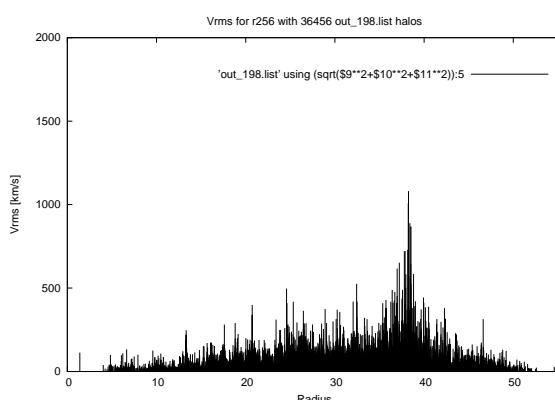
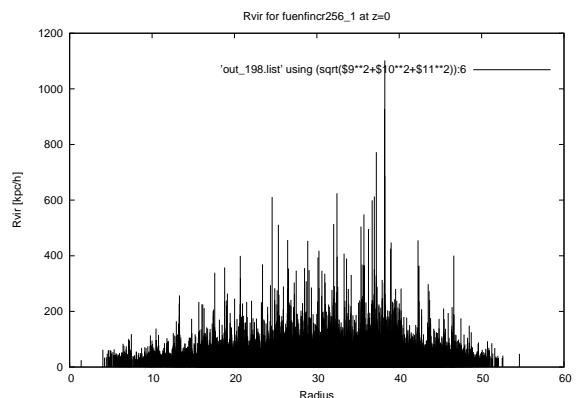
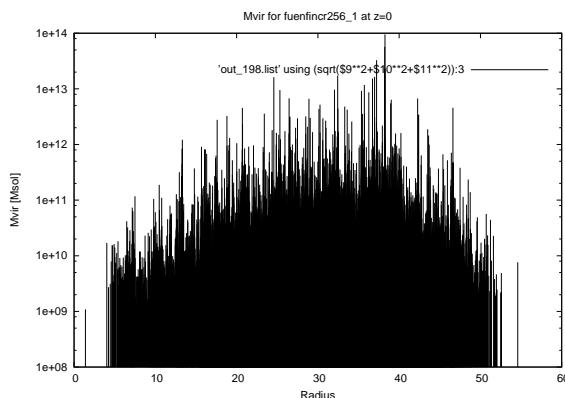
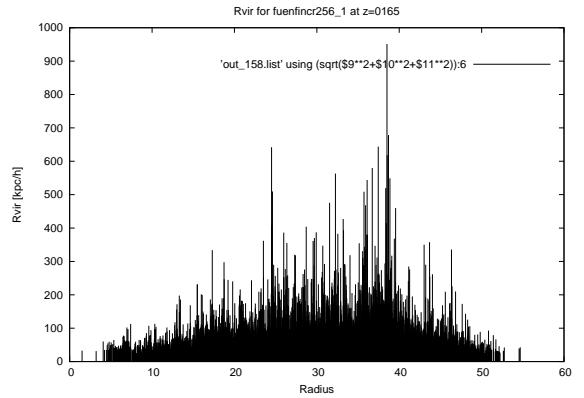
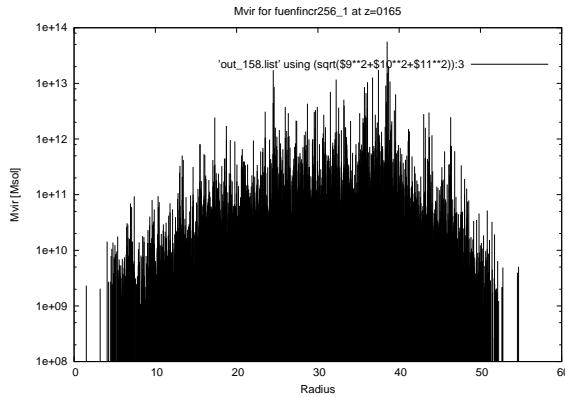
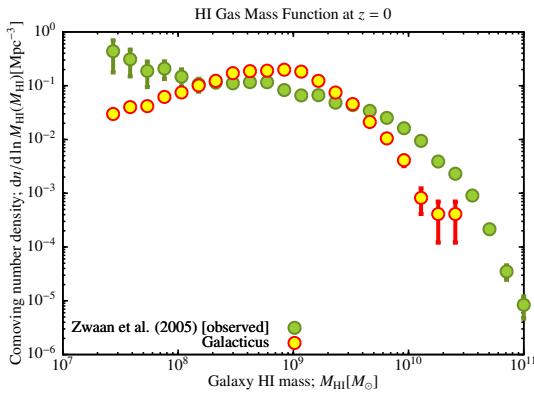
ROCKSTARRED ✓

is being rockstarred on astro-x4600-03

This run is a test if r256 and r128 (drdx\_3) are comparable → see pictures.

## fuenfincr256\_1





GALACTICUSSED √

→ re-galacticussing with rev708

GALACTICUS: rev707 exited without error but not finished

GALACTICUSSED √ BUT:

[3:46:48 PM CEST] Markus Haider: der fuenfincr256\_1 hat a problem

[3:46:52 PM CEST] Markus Haider: der hat keine output gruppe

[3:46:58 PM CEST] Markus Haider: also keinen output

[3:47:30 PM CEST] Markus Haider: btw schon einen output

[3:47:34 PM CEST] Markus Haider: aber es scheint was zu fehlen

→ E-Mail to Andrew

→ re-converted with bugfixed converter

Running model.....

Reading data for metallicity log10(Z/Z\_Solar) = 0.198

Found 188 ages in the file

Found 1963 wavelengths in the file

gsl: ../../roots/brent.c:57: ERROR: function value is not finite

Default GSL error handler invoked.

tree copied to markus transfer

GALACTICUS:

Fatal error in Build\_Descendent\_Pointers():

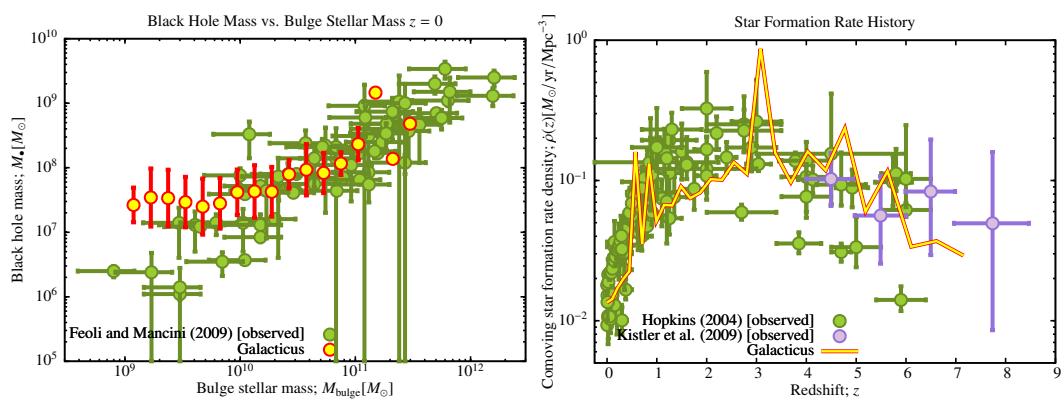
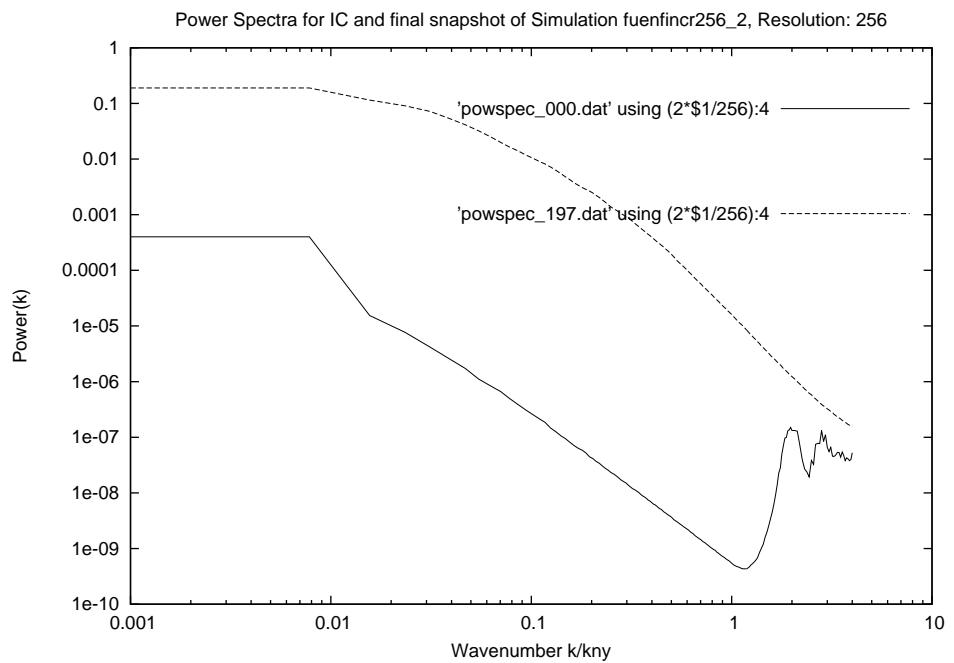
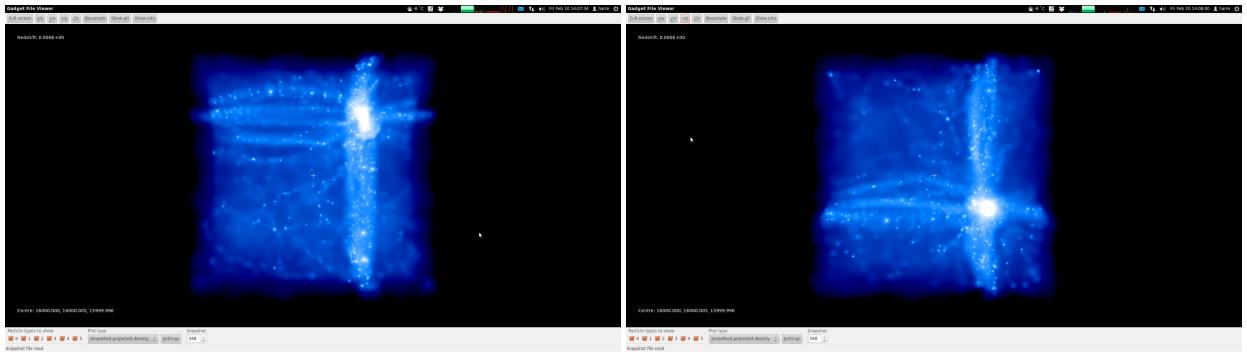
failed to find descendent node: 12048576 of 12014628

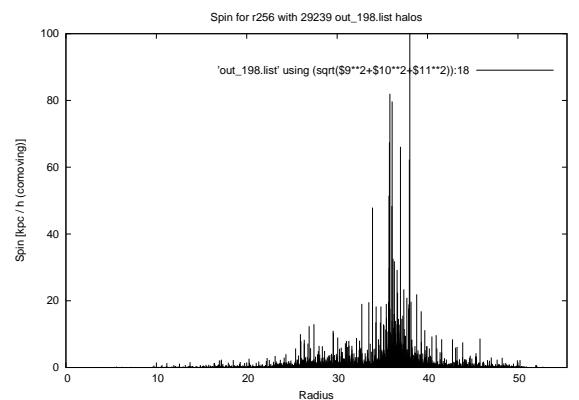
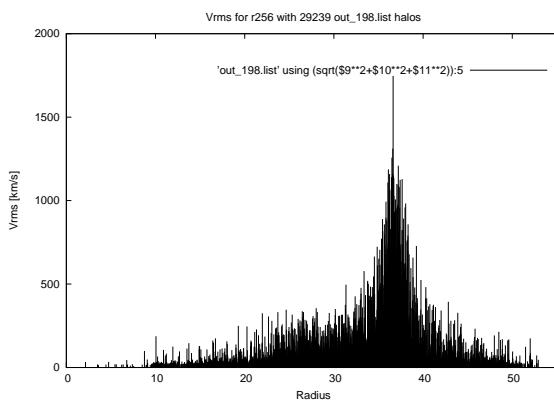
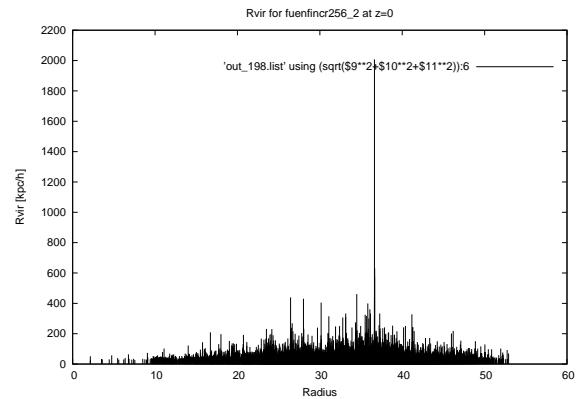
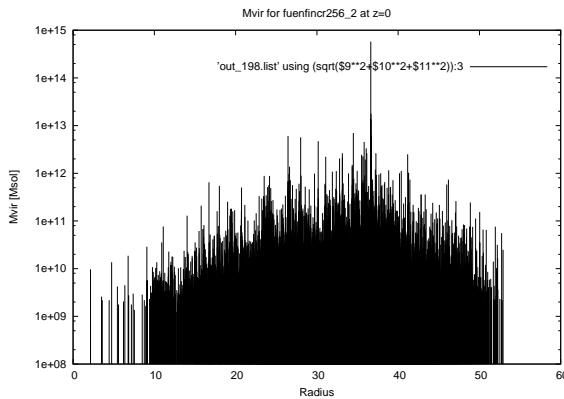
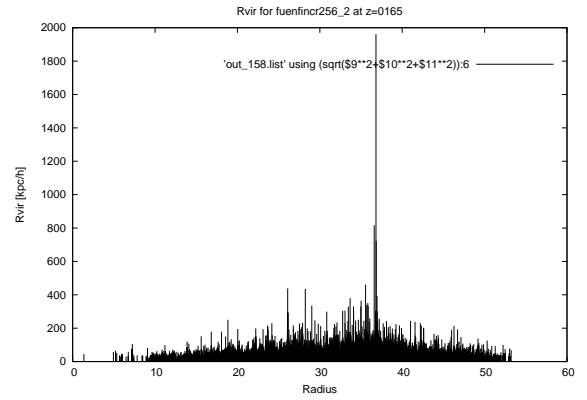
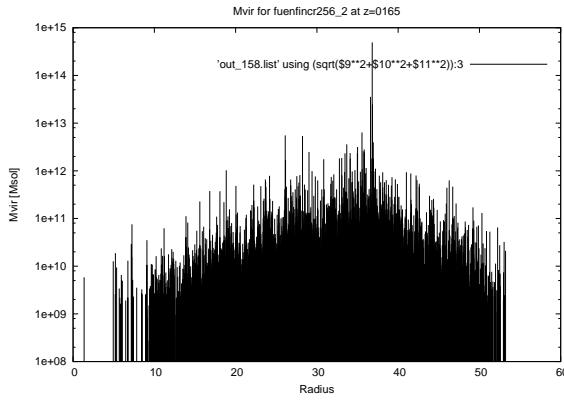
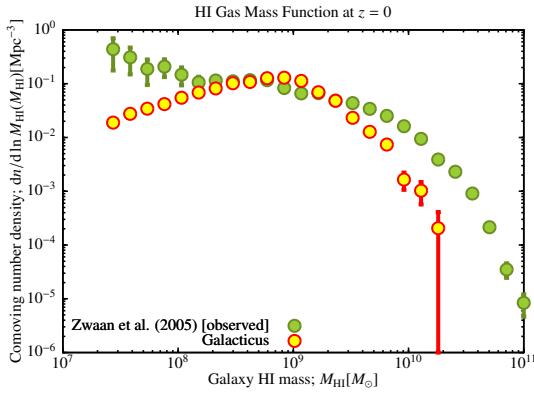
galacticus.sh: line 67: 5751 Aborted

ROCKSTARRED √

CONSISTENTTREED √

fuenfincr256\_2 → dump!



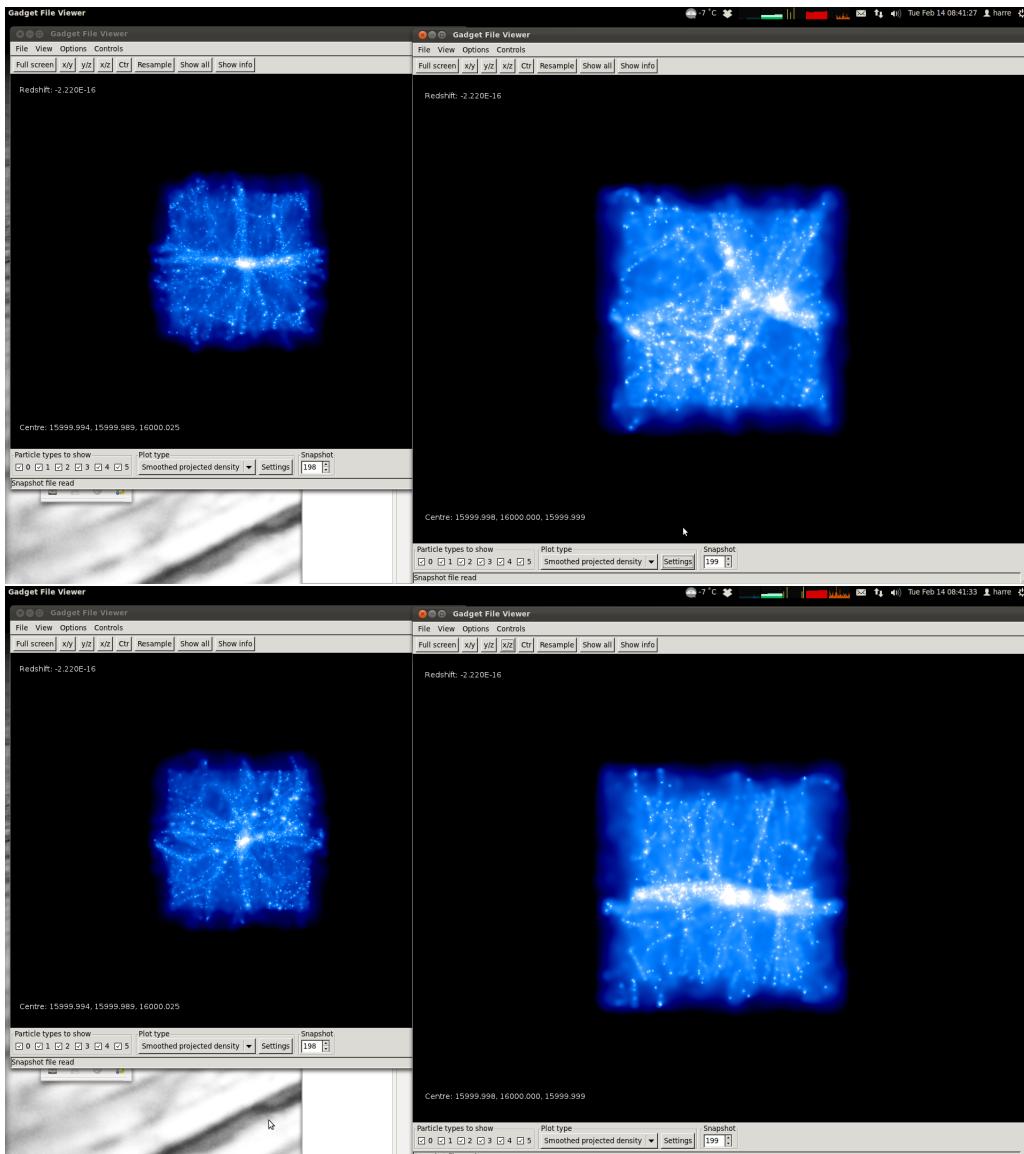


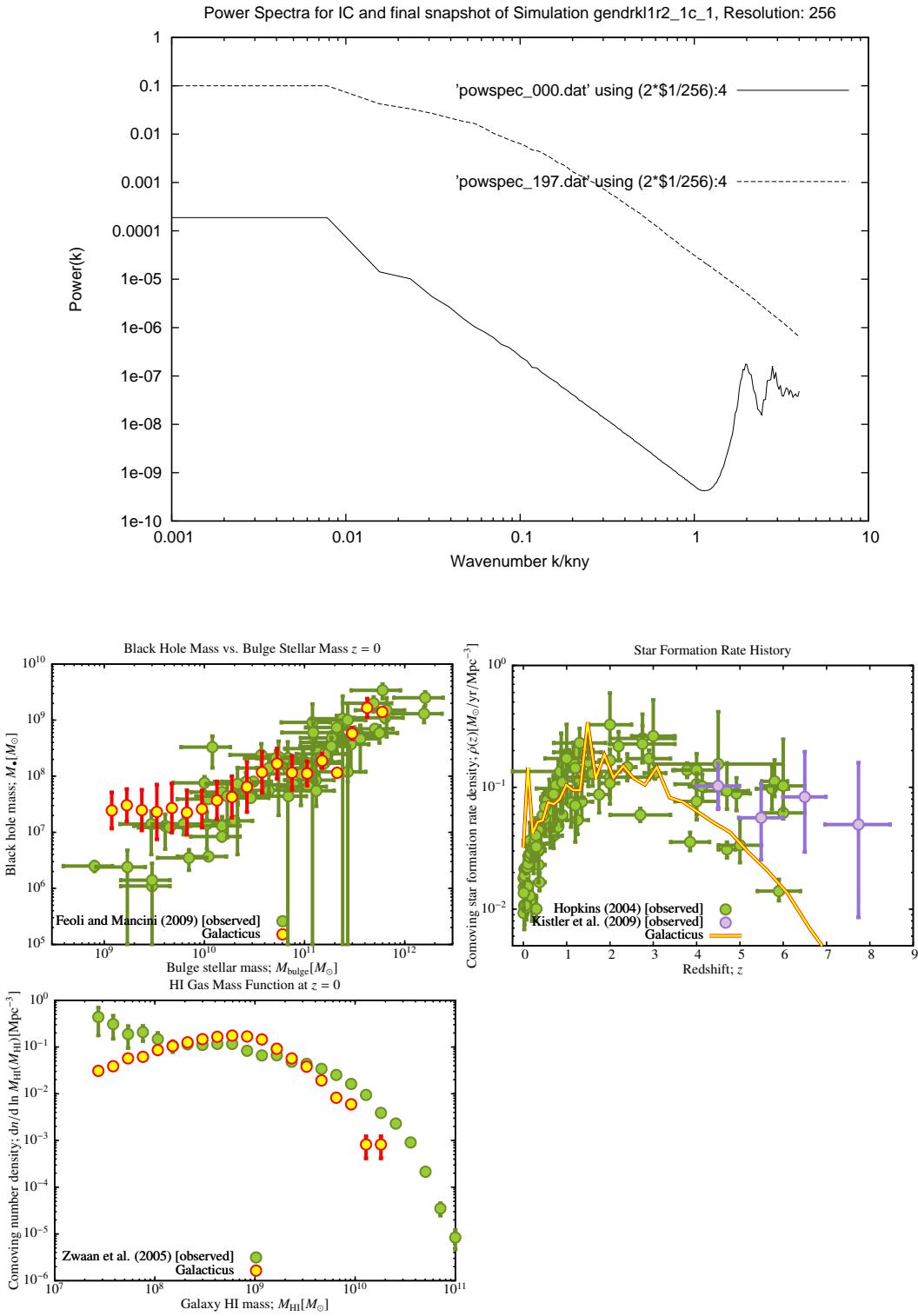
GALACTICUSSED ✓ → gadgetviewer: simulation has "artificial" cross on right upper corner  
→ DUMP IT ?  
→ re-converted with bugfixed converter (v0.3)  
galacticus running on SGE  
is being galacticussed → job seems to run!  
GALACTICUS:

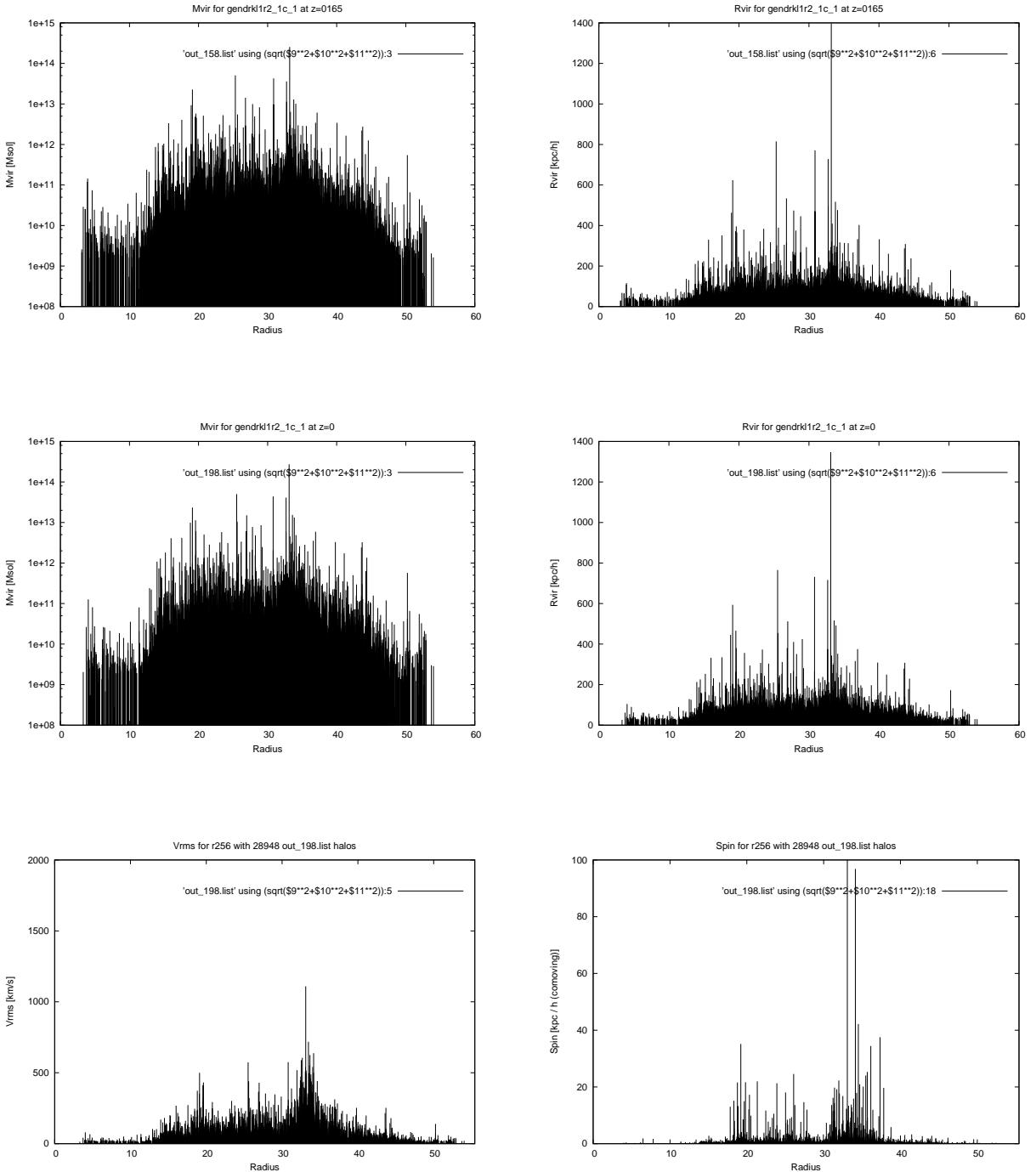
```
Fatal error in Build_Descendent_Pointers():
failed to find descendent node
```

CONSISTENTTREEED ✓  
ROCKSTARRED ✓ (lasted about 9000minutes)

## gendrkl1r2\_1c\_1







GALACTICUSSED WITH REVISION 709 ✓ CONSISTENTTREED ✓  
 ROCKSTARRED ✓  
 is being rockstarred on `astro-x4600-03`

E-Mail sent to Bertschinger

```
$ diff drkt+3c+s15_1+r2/constraints_drkt+3c+s15_1+r2.f
r128/h100/gendrk11_1c_1/constraints_gendrk11_1c_1.f

$ diff gendrk11r2_1c_1/grafic_inc_gendrk11r2_1c_1.f
r128/h100/gendrk11_1c_1/grafic_inc_gendrk11_1c_1.f
```

```

5c5
< parameter (np1=256,np2=256,np3=256,ncon=1)
---
> parameter (np1=128,np2=128,np3=128,ncon=1)

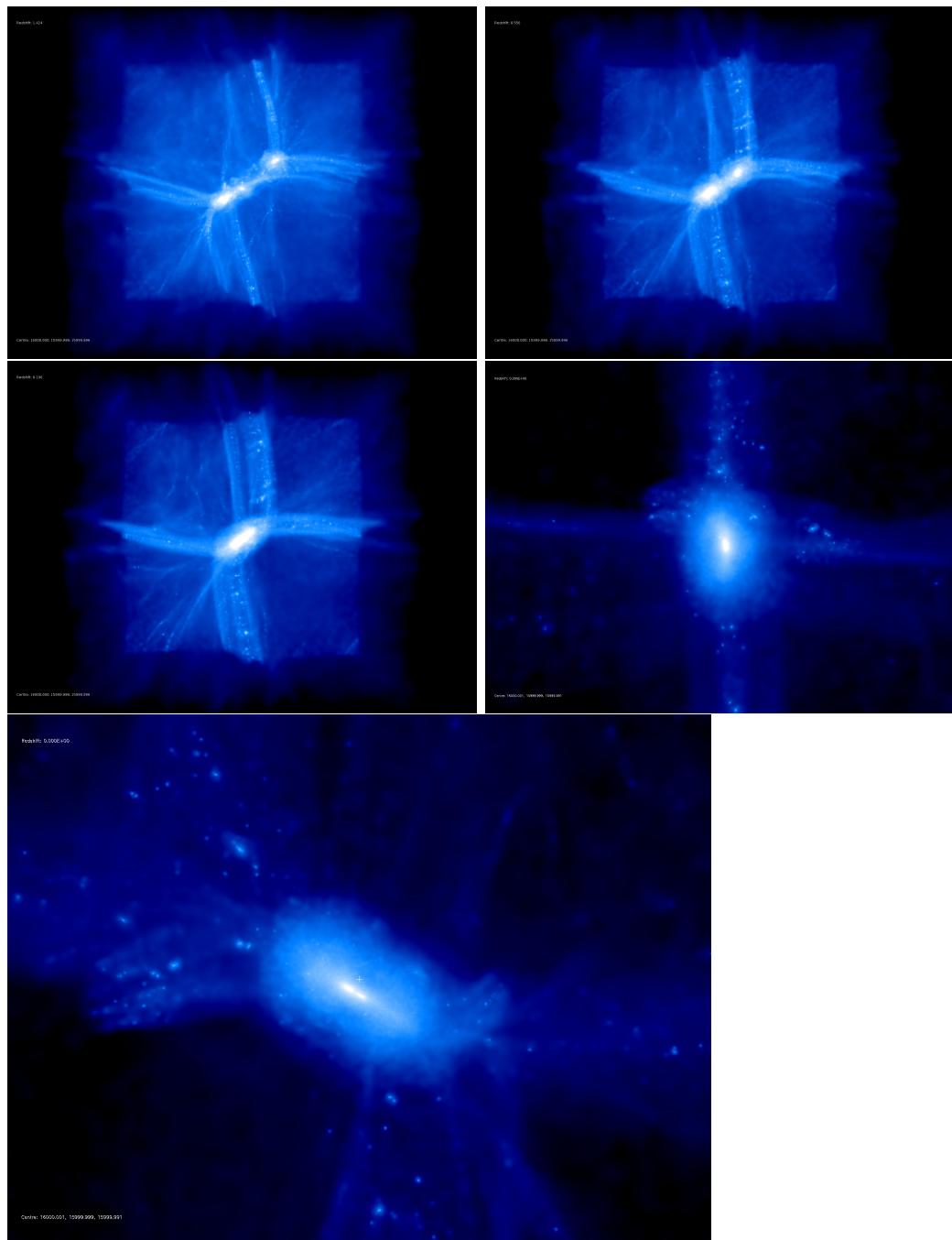
diff gendrk1r2_1c_1/graficIO_gendrk1r2_1c_1.out r128/h100/gendrk1_1c_1/graficIO_gendrk1_1c_1.out
23c23
< Particle lattice size: np1,np2,np3=          256          256          256
---
> Particle lattice size: np1,np2,np3=          128          128          128
25,27c25,27
< chosen: 0.12500000 0.0000000 5.00000007E-02
< npart, L_x, L_y, L_z= 16777216 32.00 32.00 32.00 Mpc
< Particle mass= .1447E+09 solar masses
---
> chosen: 0.25000000 0.0000000 5.00000007E-02
> npart, L_x, L_y, L_z= 2097152 32.00 32.00 32.00 Mpc
> Particle mass= .1158E+10 solar masses
37c37
< ak,akmax= 16.100662 16.000005475554534
---
> ak,akmax= 16.068306 16.000005475554534
40,41c40,41
< Mean sigma_delta, sigma_psi= 4.8100653 4.7177238 Mpc
< Chisq, dof, nu= 16781832. 16777215 0.79710007
---
> Mean sigma_delta, sigma_psi= 4.1531582 4.7162638 Mpc
> Chisq, dof, nu= 2095840.0 2097151 -0.64012647
43c43
< Constraint 1: Sampled, desired= 0.28453870E-02 0.25000000E-01
---
> Constraint 1: Sampled, desired=-0.64672055E-02 0.25000000E-01
46c46
< Sampled, desired= 0.21657717 16.718990
---
> Sampled, desired= 1.1184790 16.713776
49c49
< Constraint 1: Final= 0.25000000E-01
---
> Constraint 1: Final= 0.25000002E-01
52,54c52,54
< sigma_delta, sigma_psi= 4.9692168 7.6522889 Mpc
< Chisq, dof= 16781832. 16777214
< Maximum delta, displacement= 27.548712 17.026833 Mpc
---
> sigma_delta, sigma_psi= 4.2376528 6.6093922 Mpc
> Chisq, dof= 2095838.9 2097150
> Maximum delta, displacement= 22.542503 14.168747 Mpc
56c56
< Scaling density and displacements to a= 2.75129788E-02
---
> Scaling density and displacements to a= 3.36233079E-02
58,59c58,59

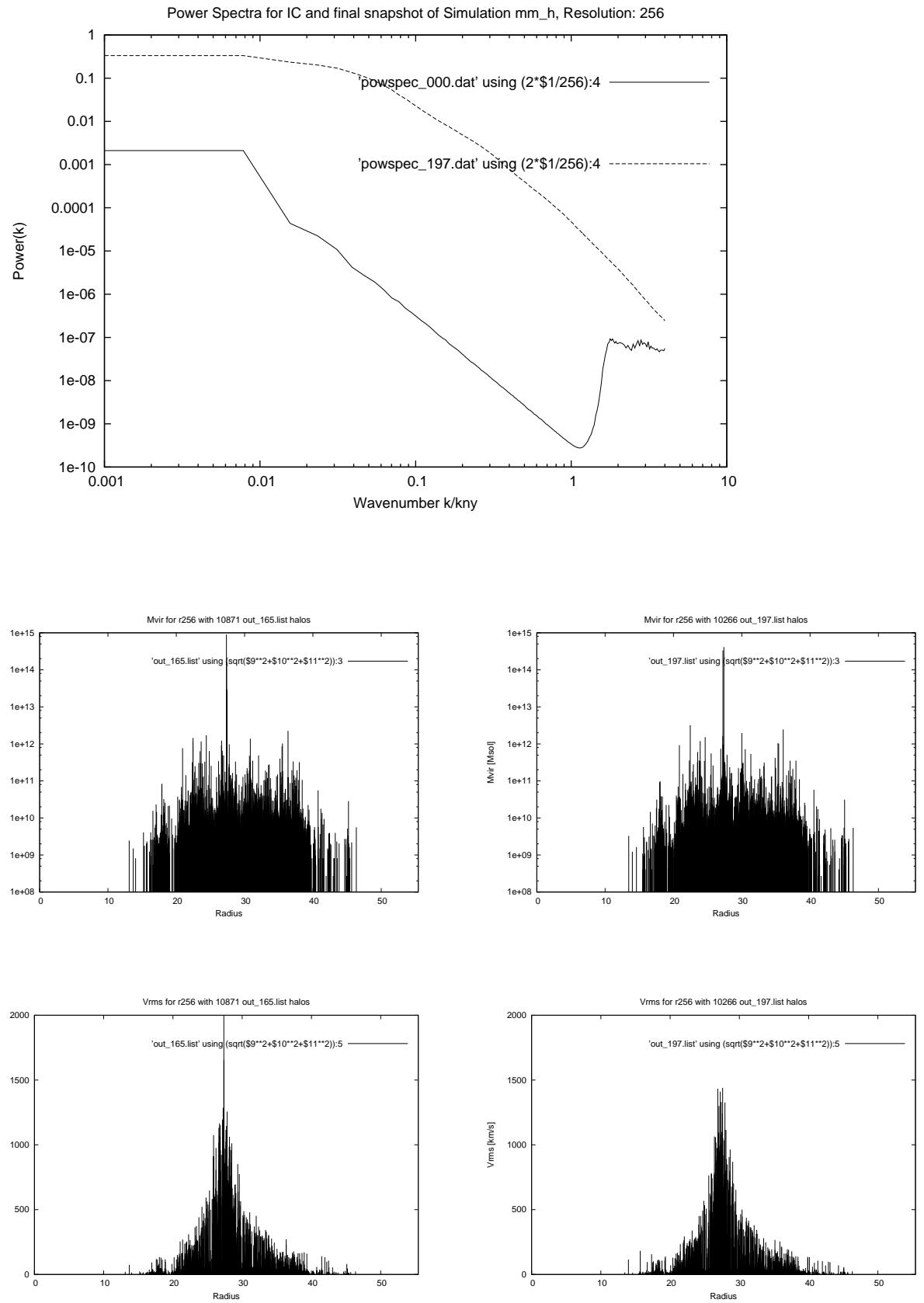
```

```
< For a=astart: linear sigma, delmax= 0.18037927      0.99999994
< RMS, max. 3-D displacement= 0.27777302      0.61806273      Mpc
---
> For a=astart: linear sigma, delmax= 0.18798503      1.0000000
> RMS, max. 3-D displacement= 0.29319692      0.62853473      Mpc
```

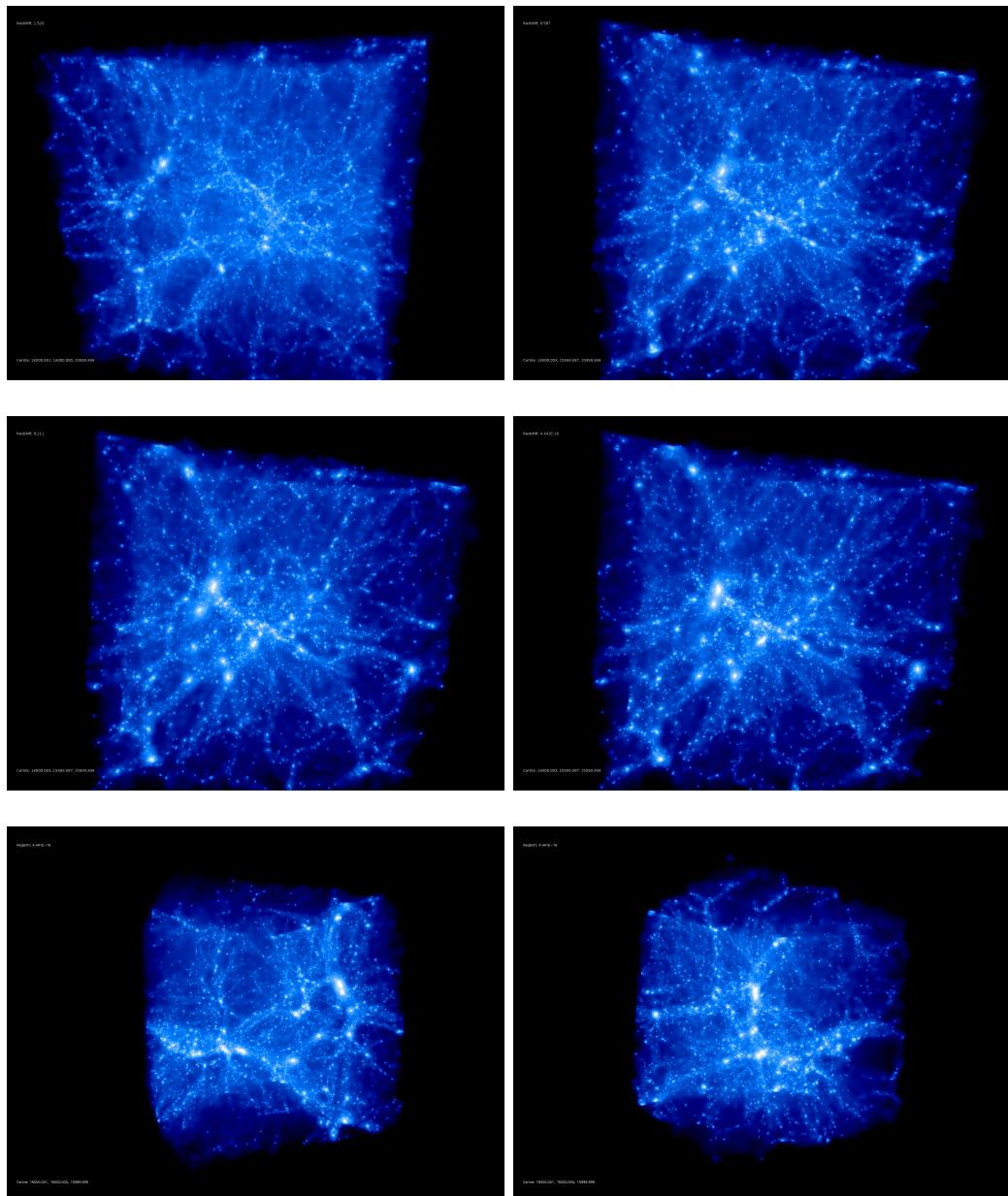
This run is a test if r256 and r128 (`gandrkl_1c_1`) are comparable → see pictures. Sims are not only different in resolution!

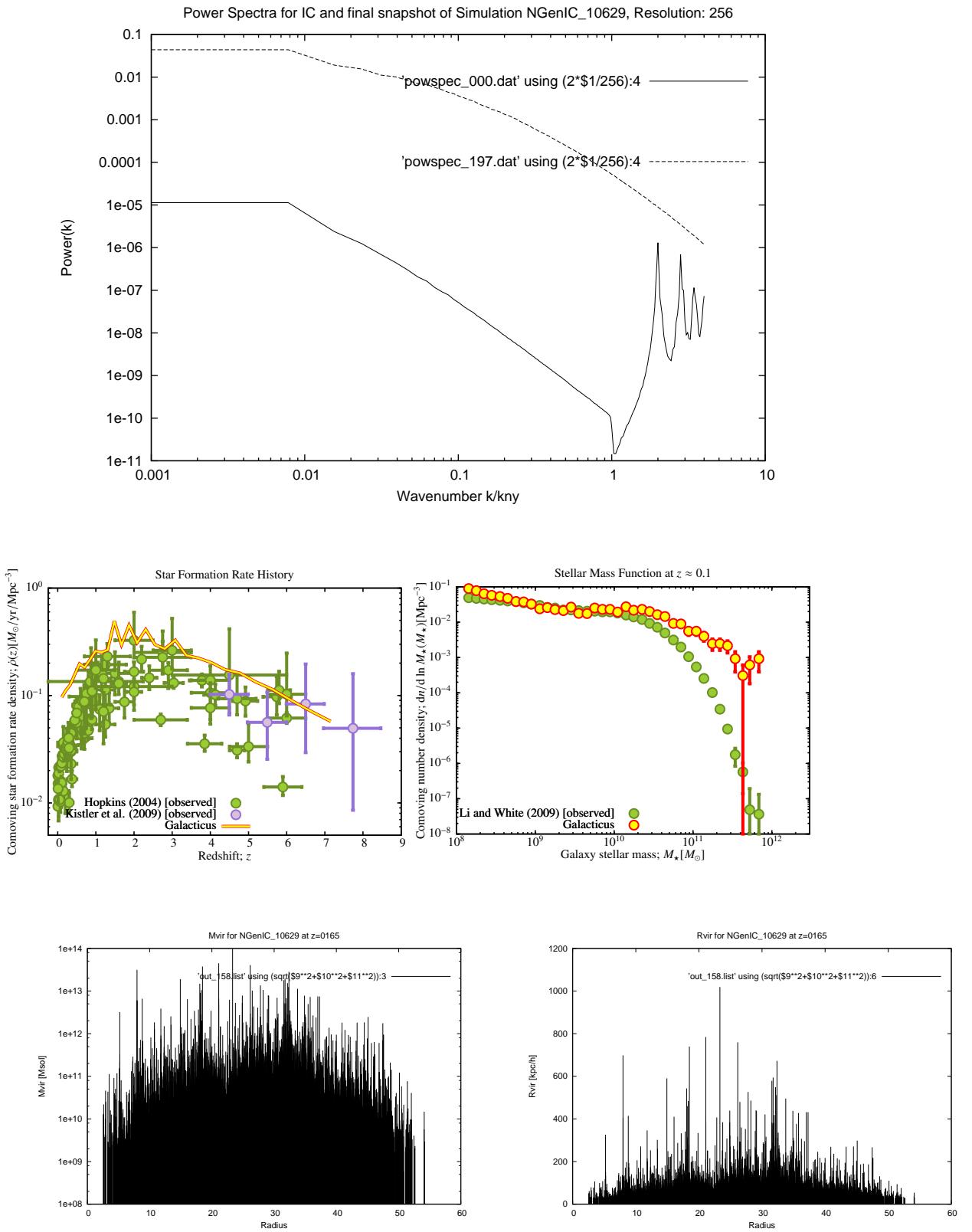
## mm\_h (major merger H comparison)

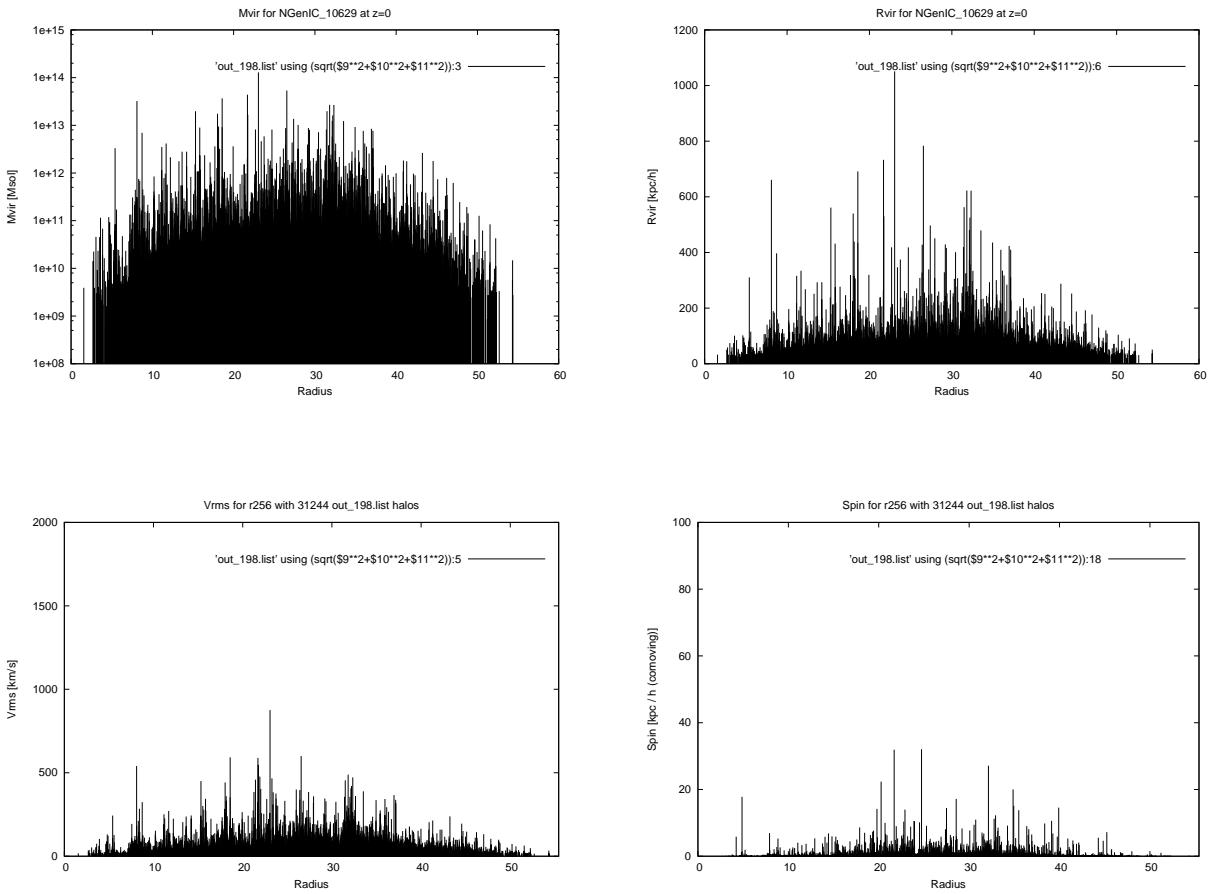




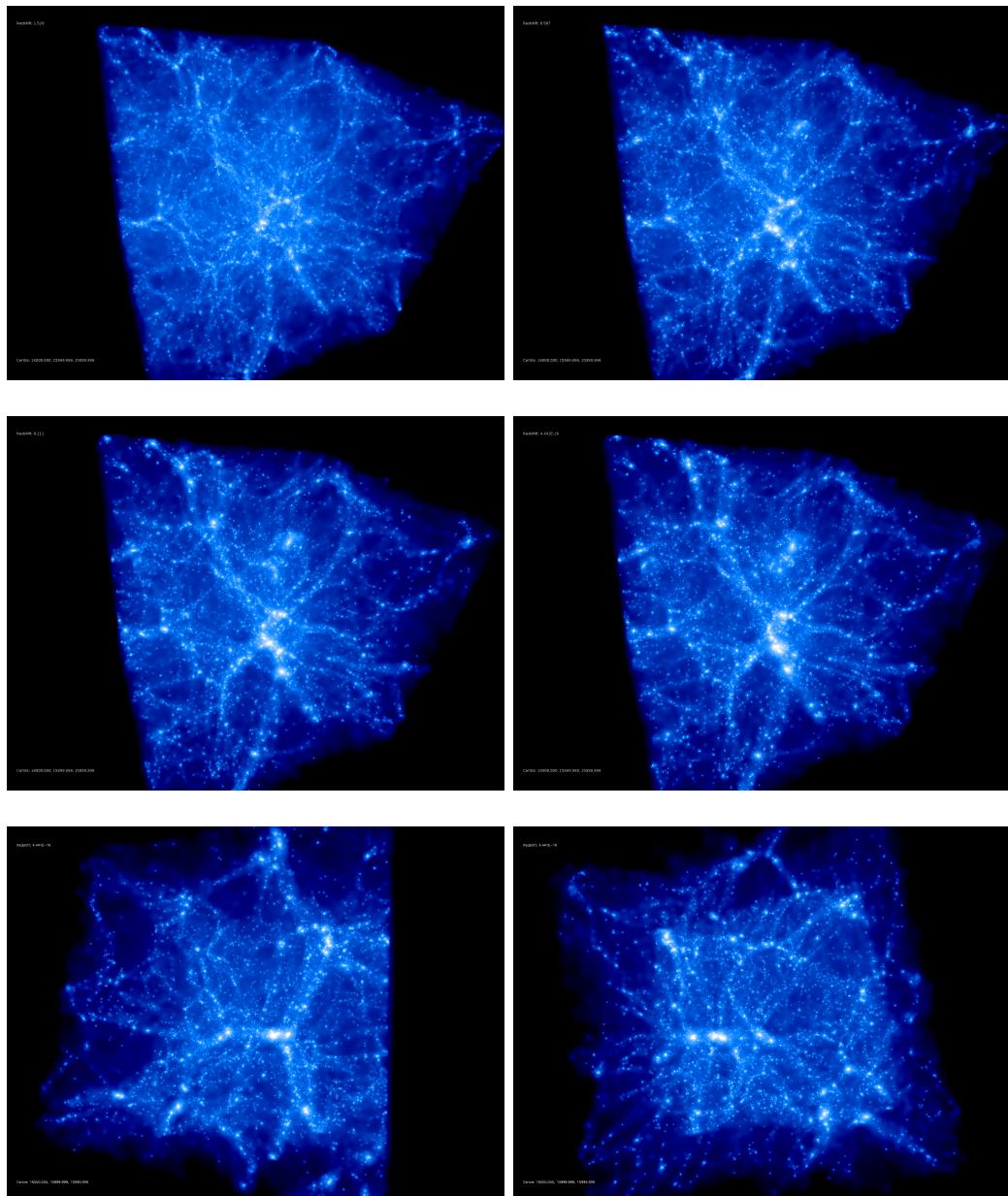
## NGenIC\_10629

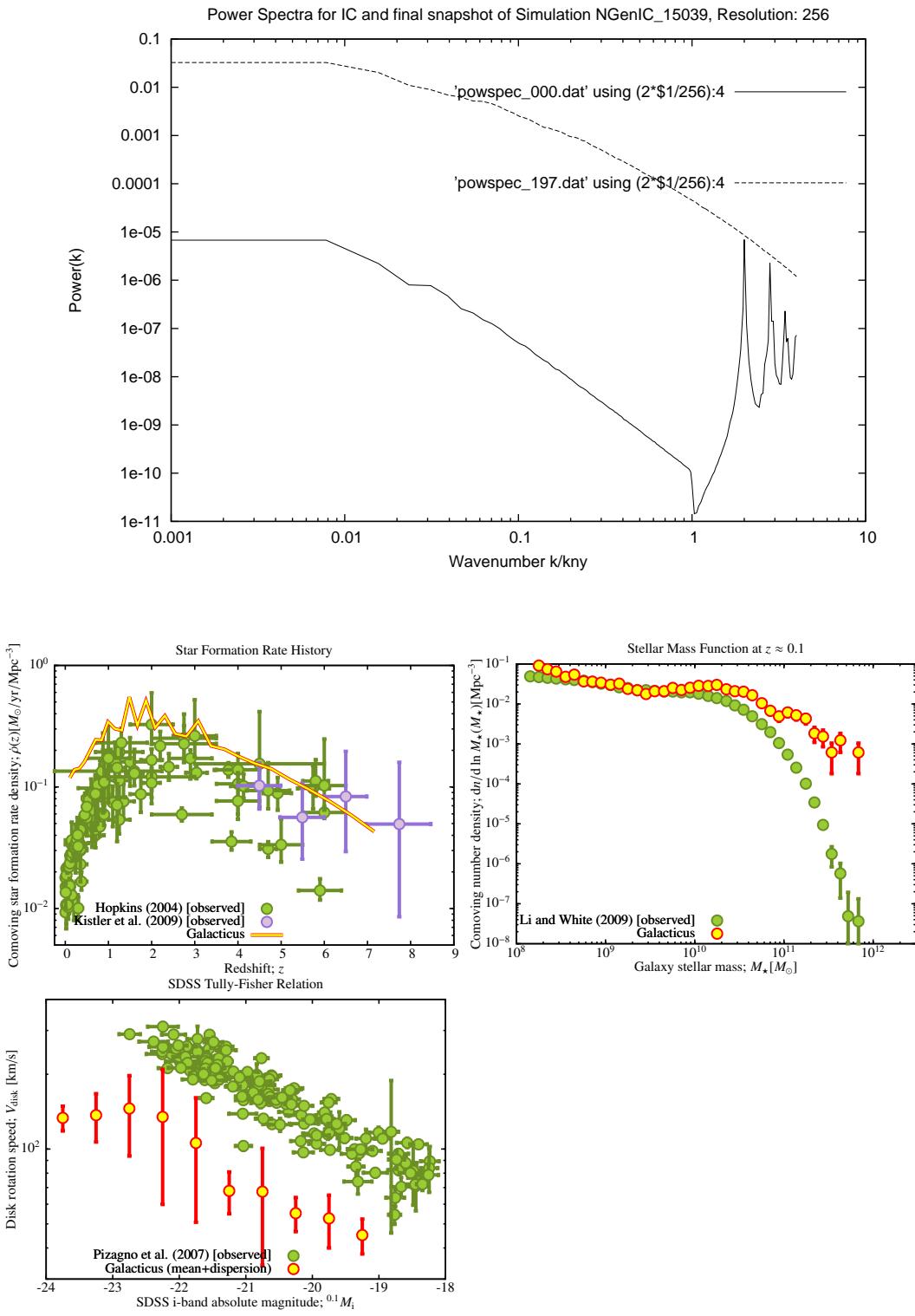


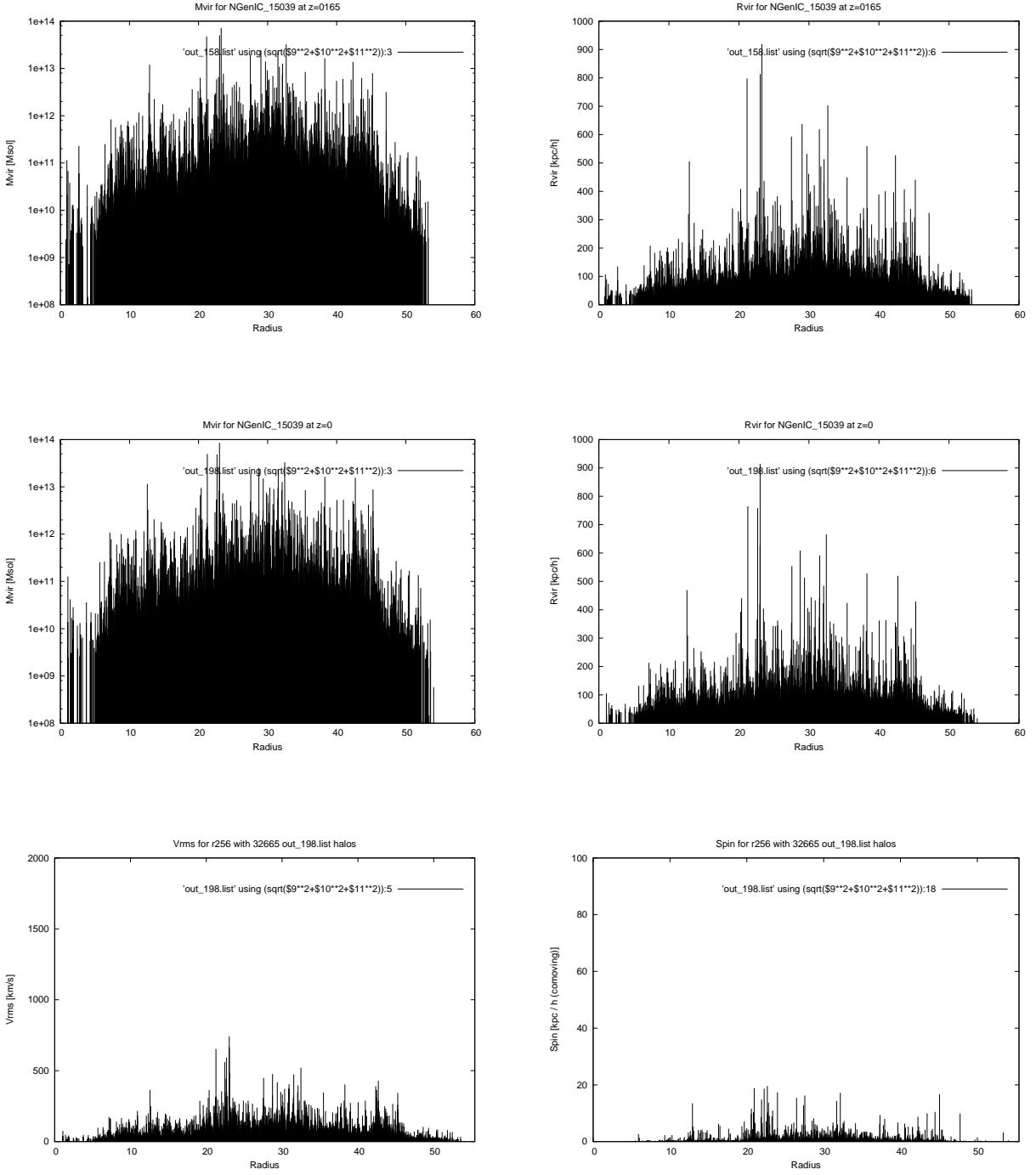




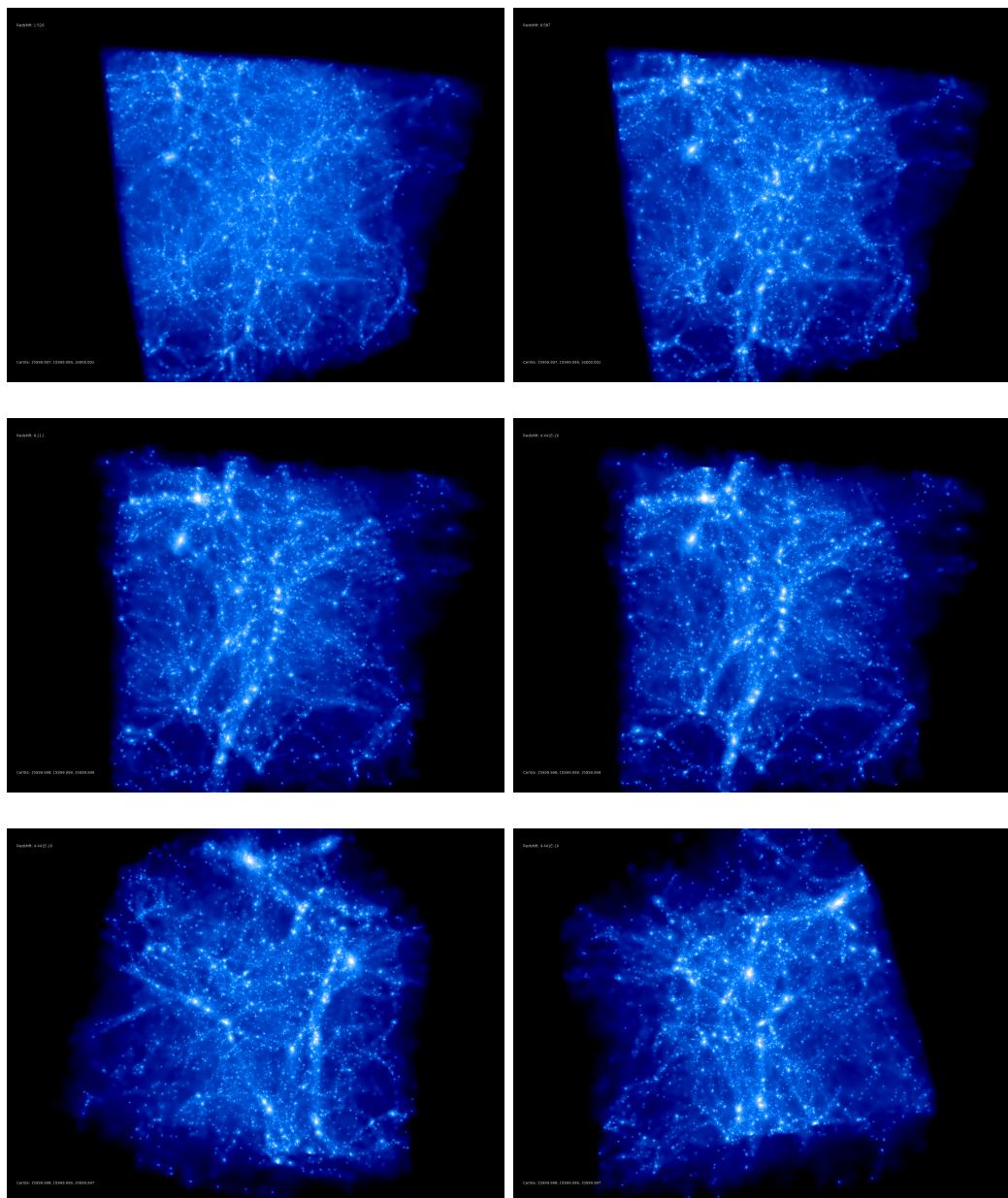
## NGenIC\_15039

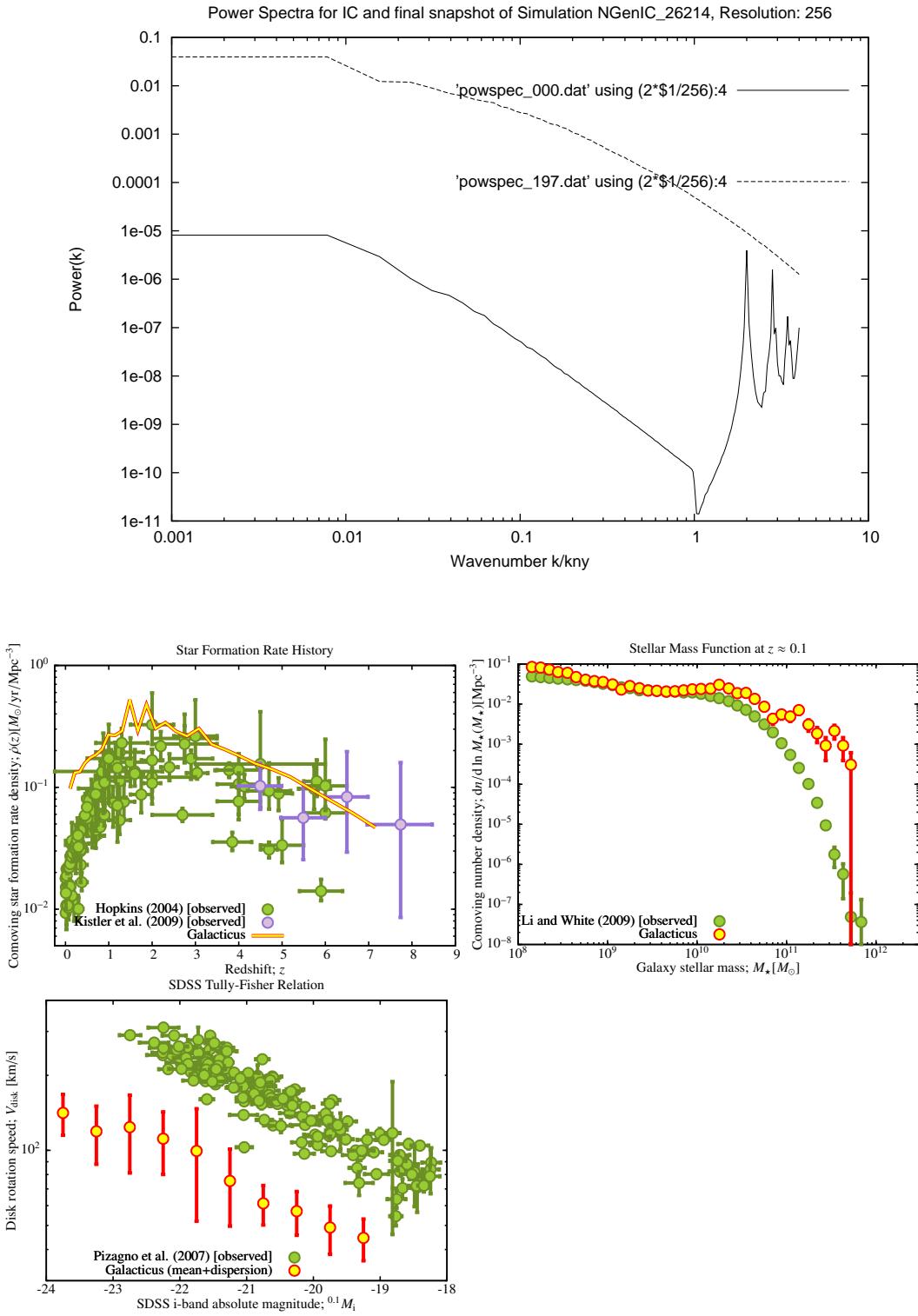


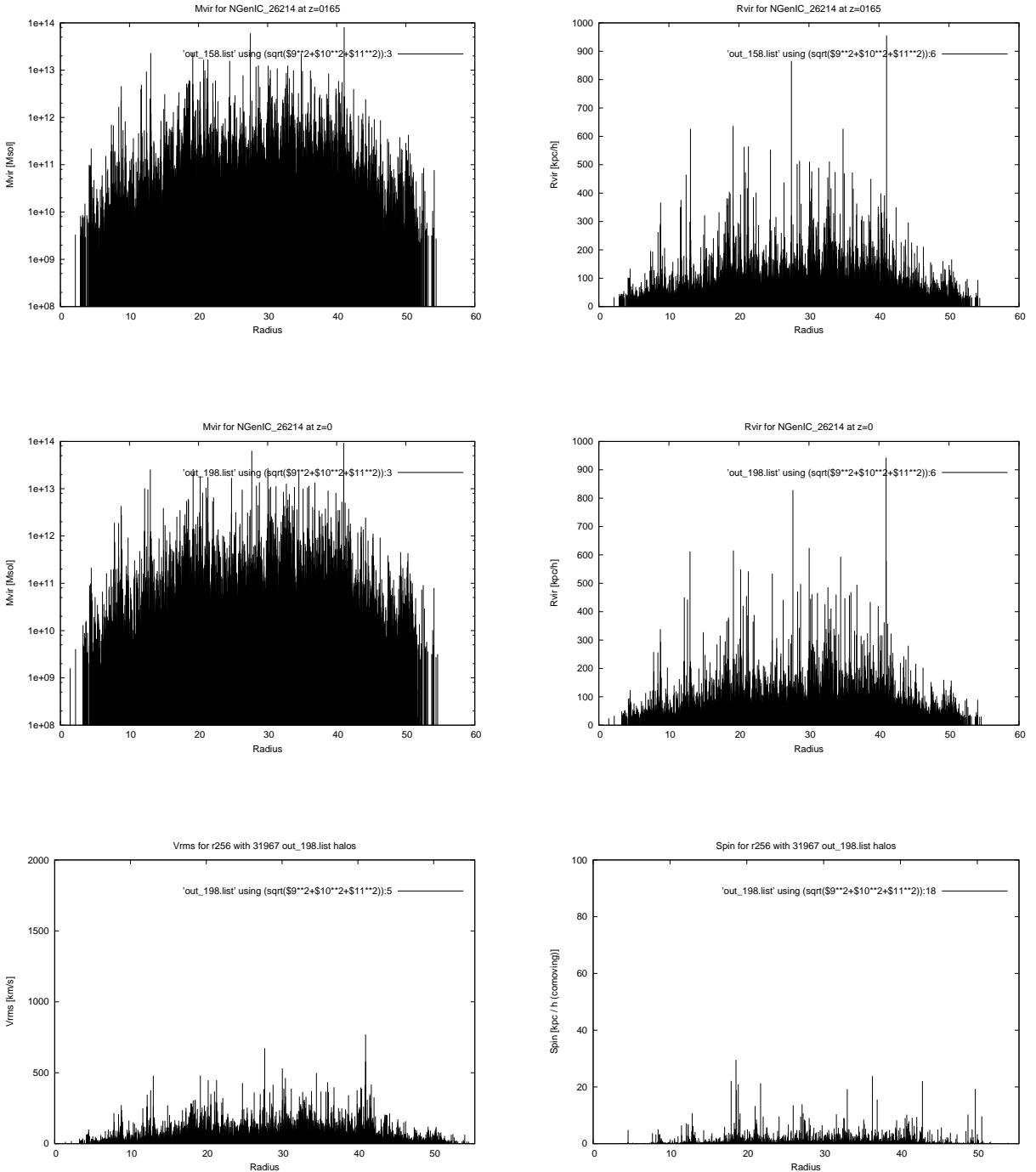




## NGenIC\_26214

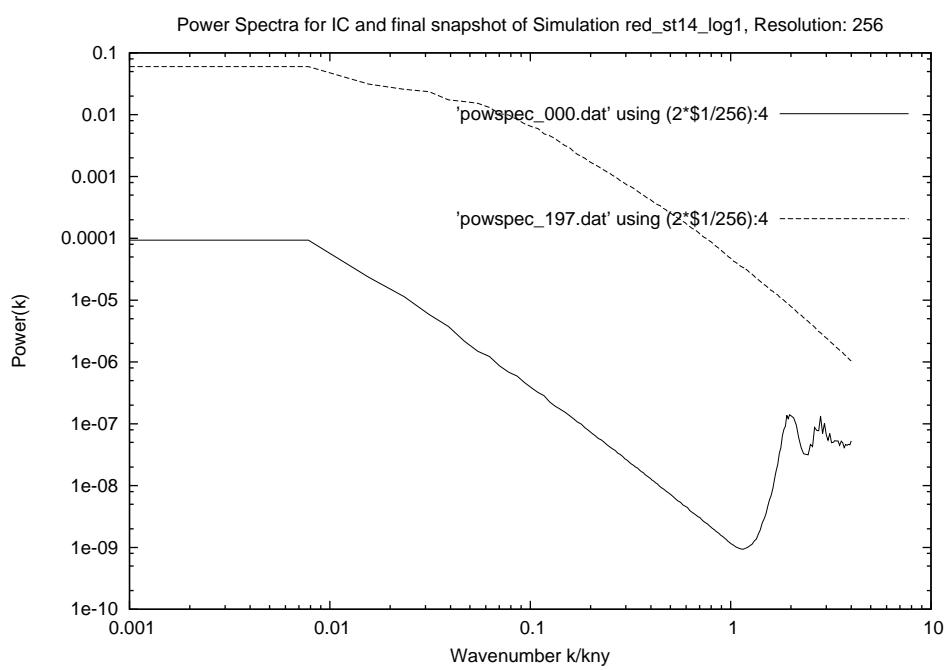
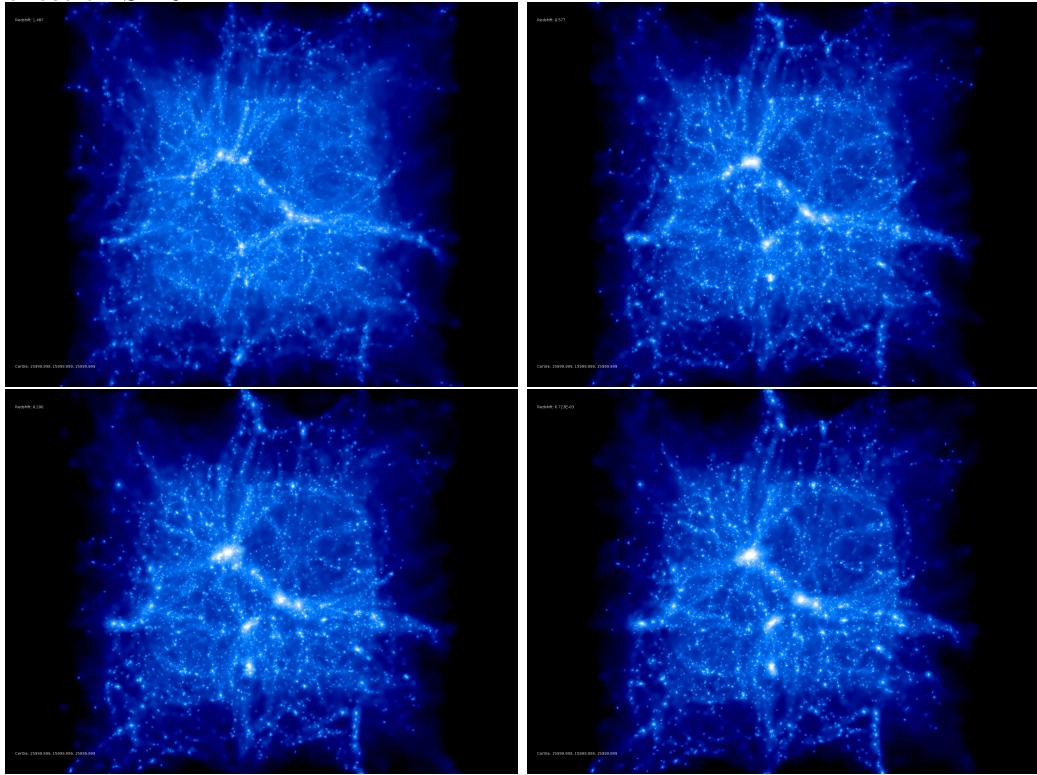


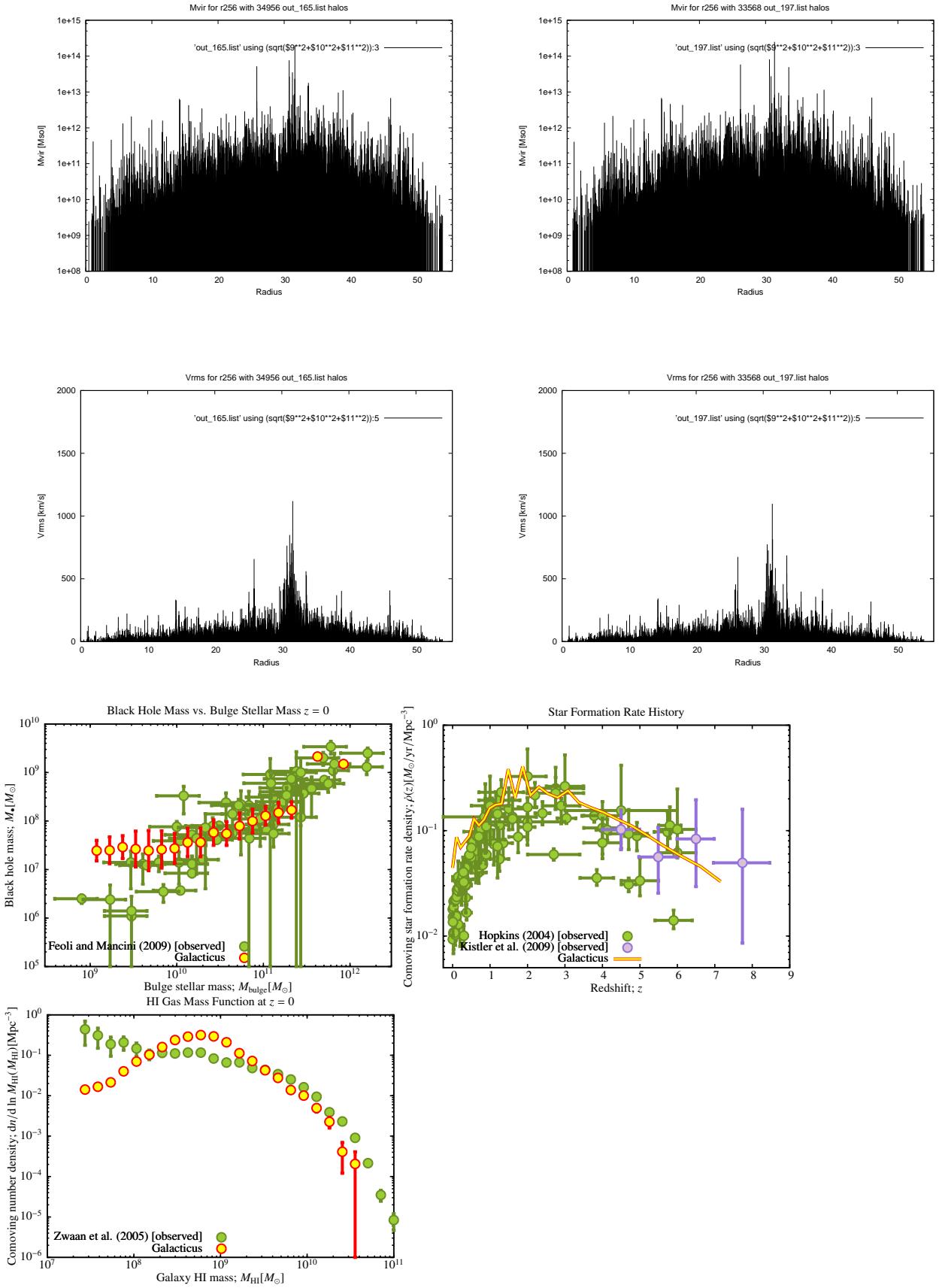




**red\_st14\_log1**

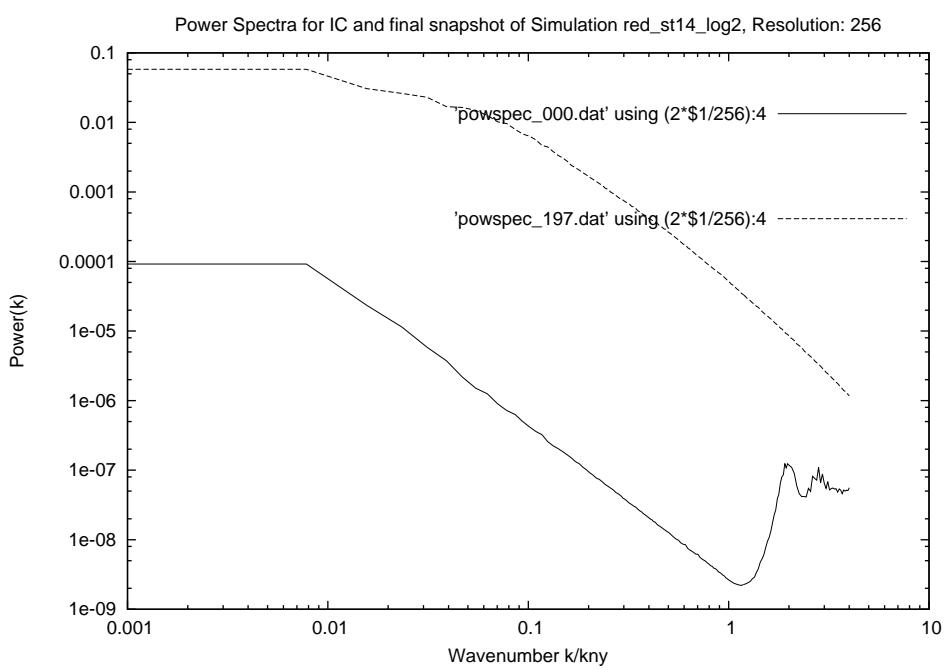
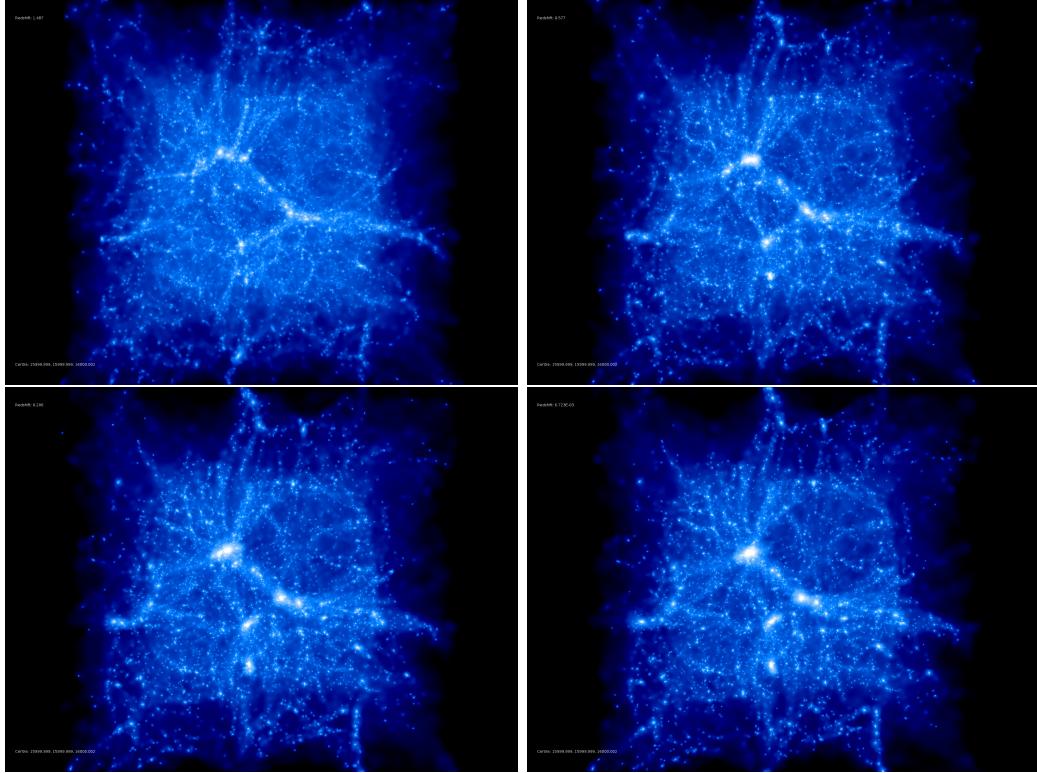
stages\_14 constraints + seed resimulated with different linger.dat in order to test its effect on SFR.

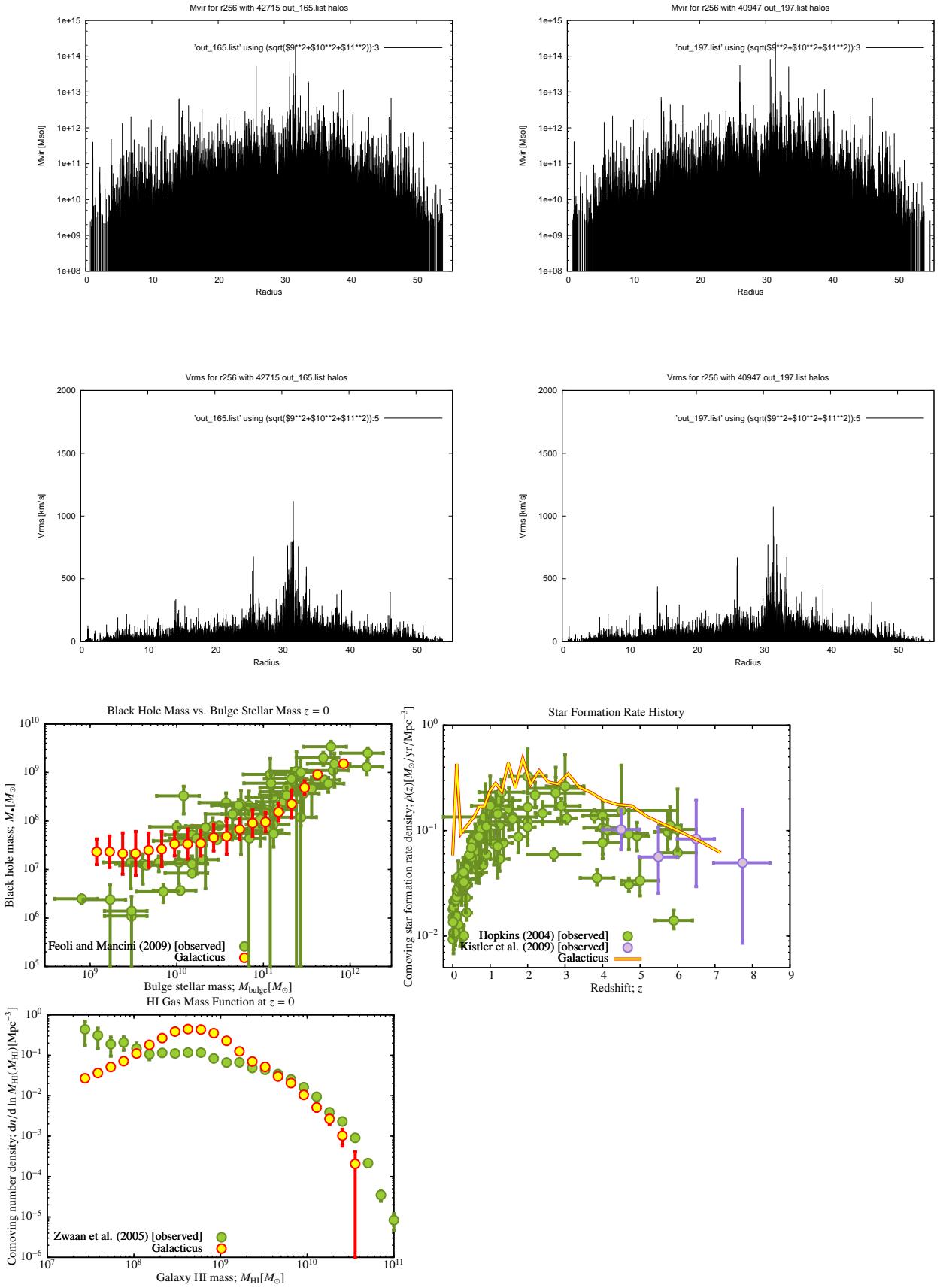




**red\_st14\_log2**

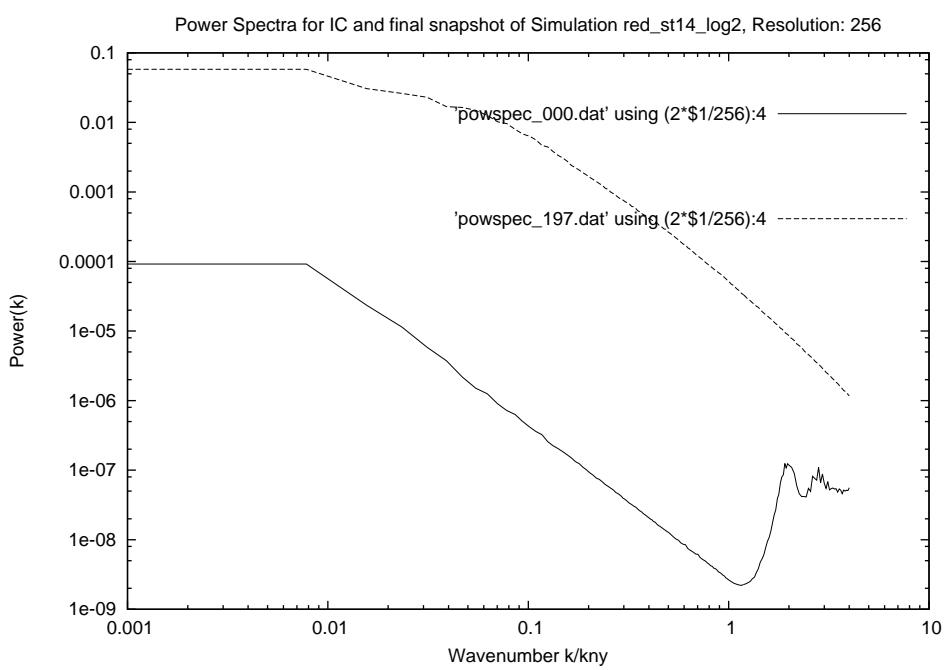
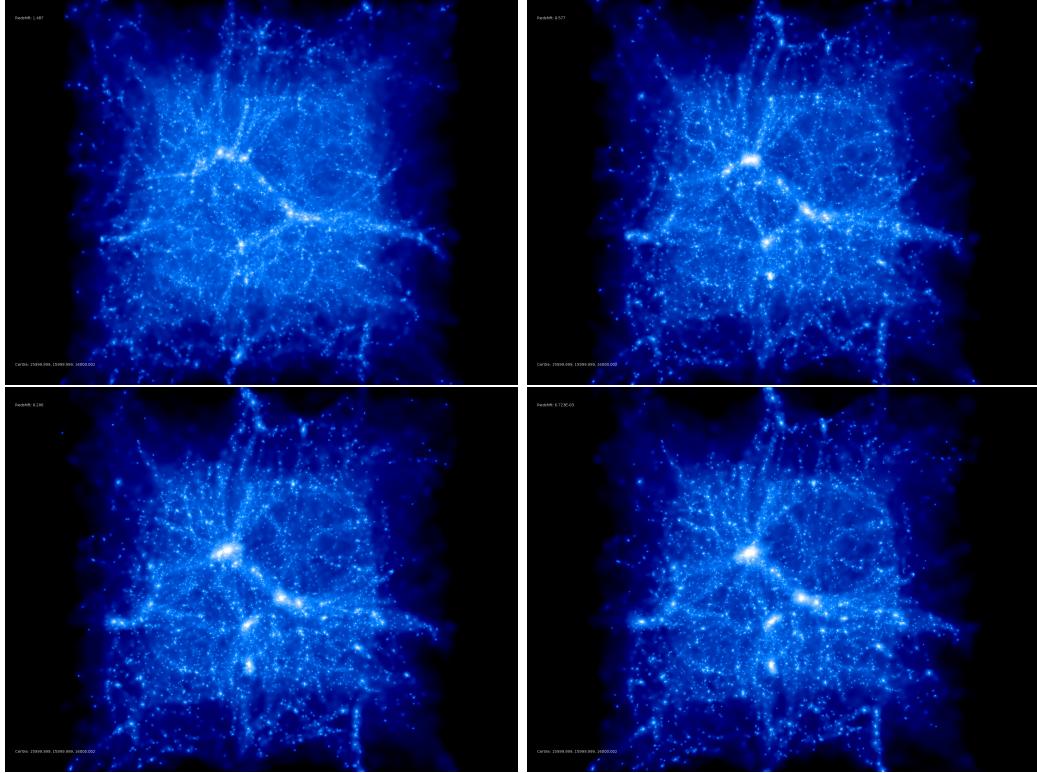
`stages_14` constraints + seed resimulated with different `linger.dat` in order to test its effect on SFR.

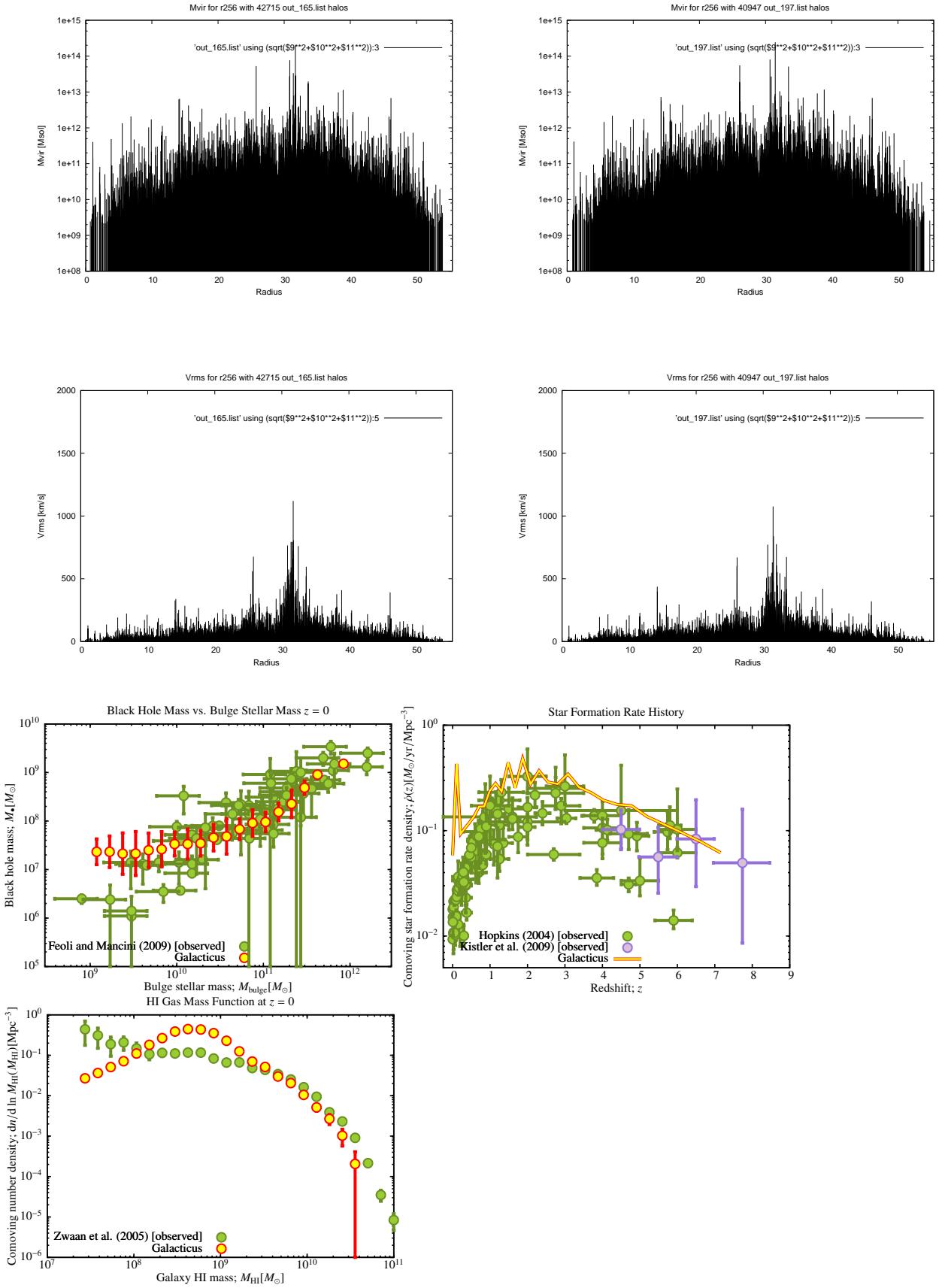


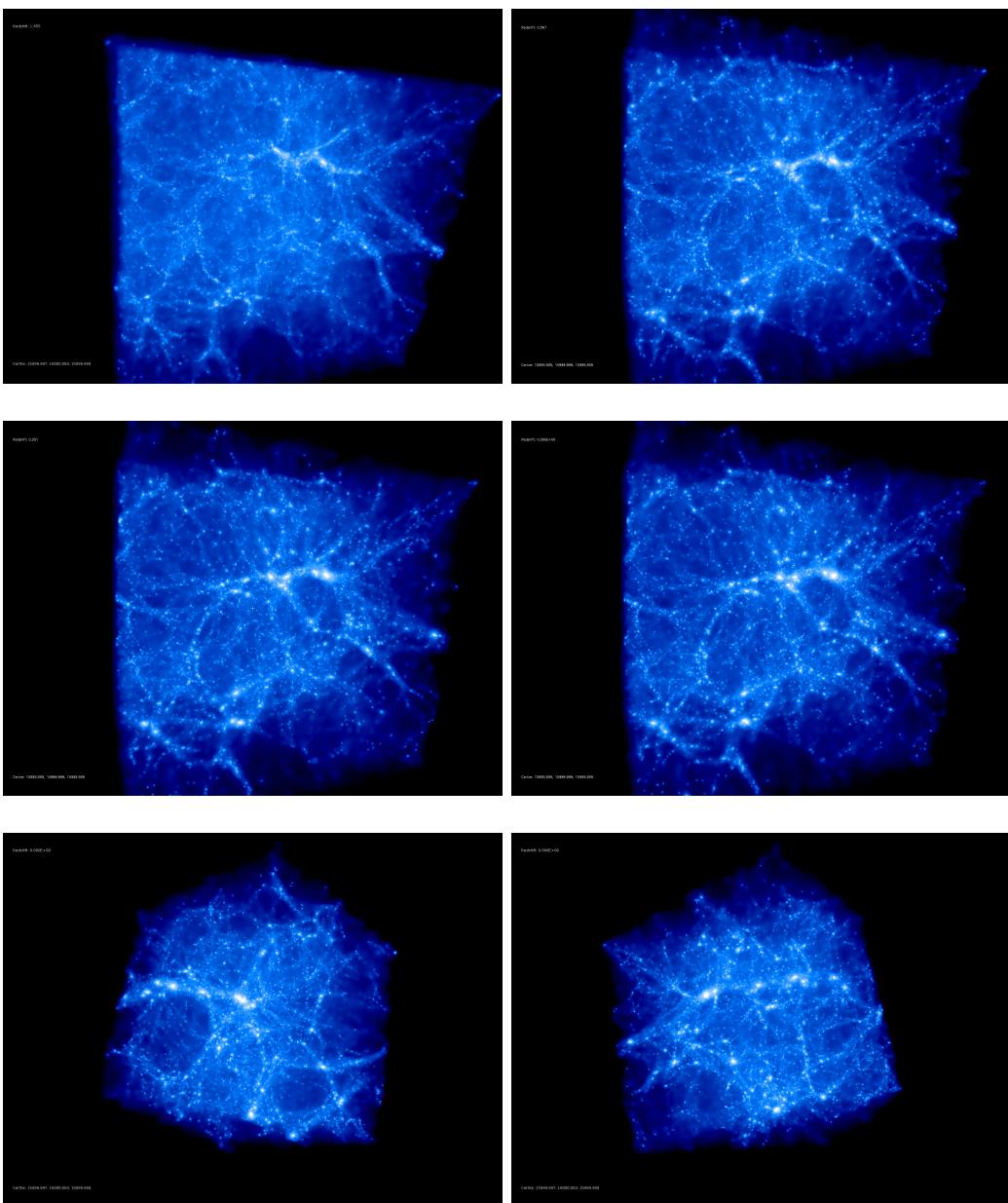


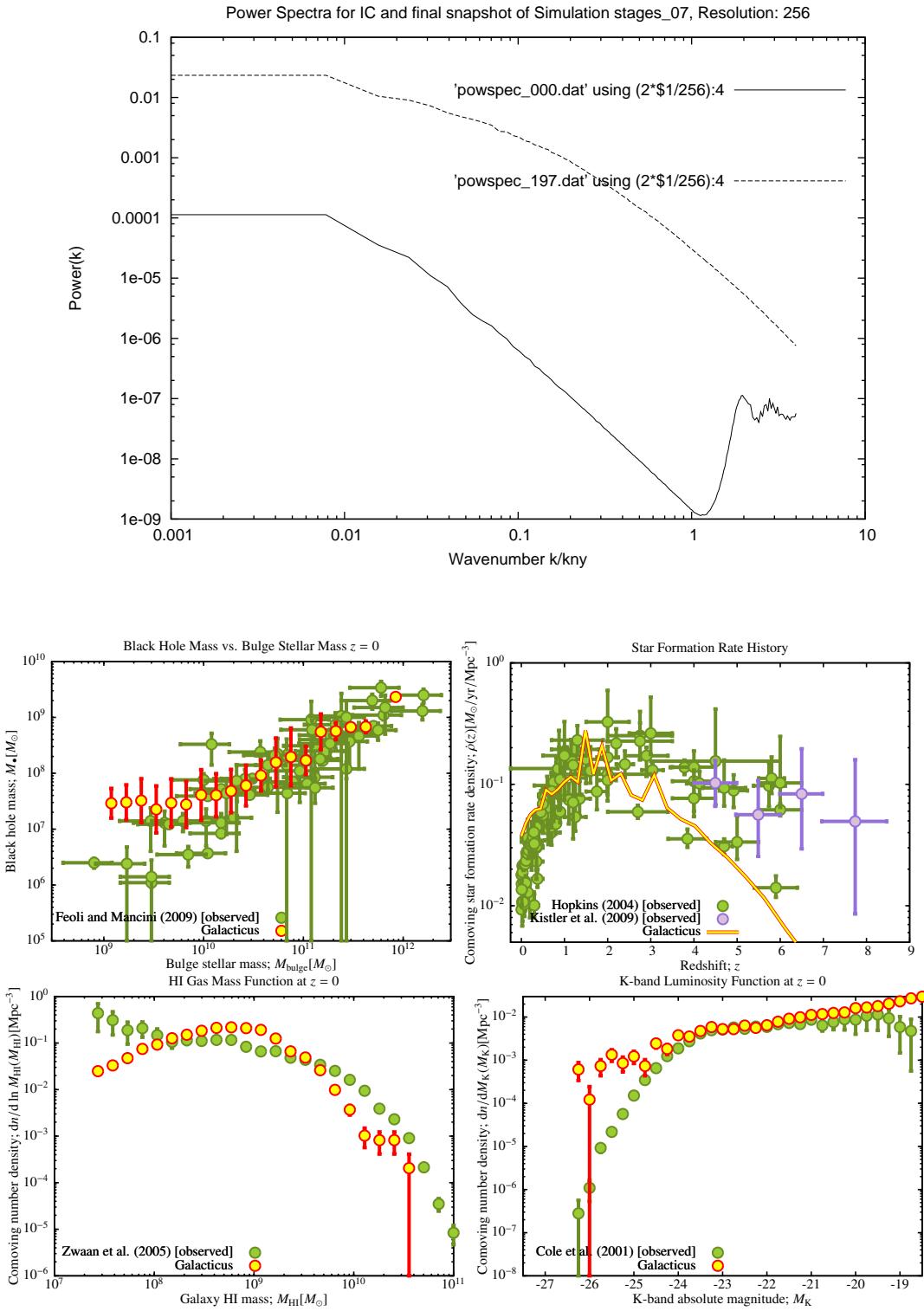
**rst14lg3**

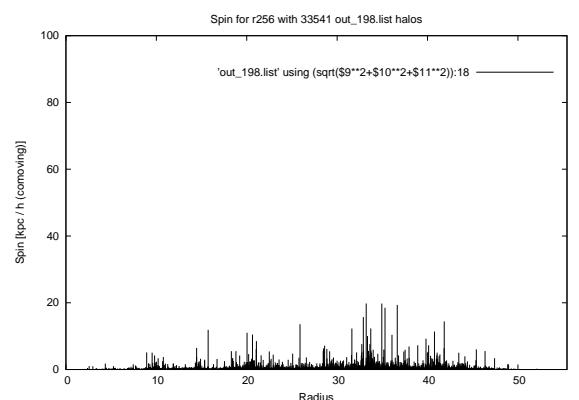
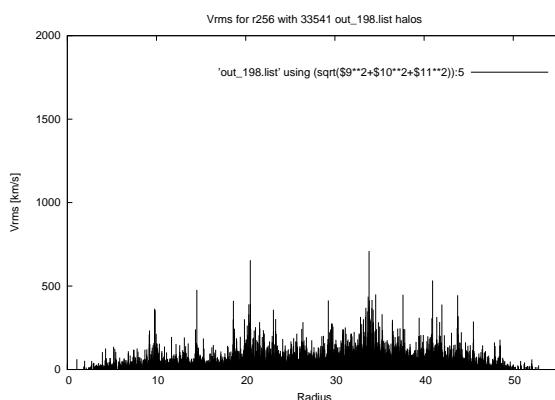
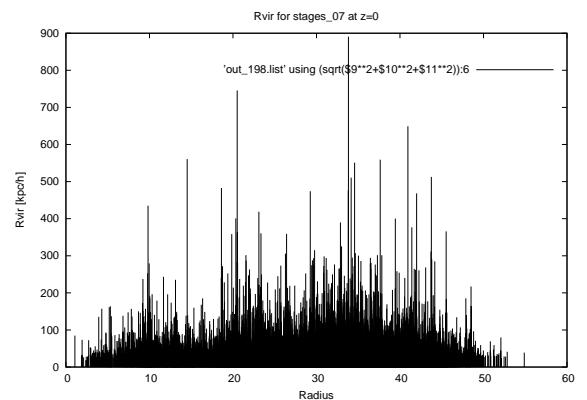
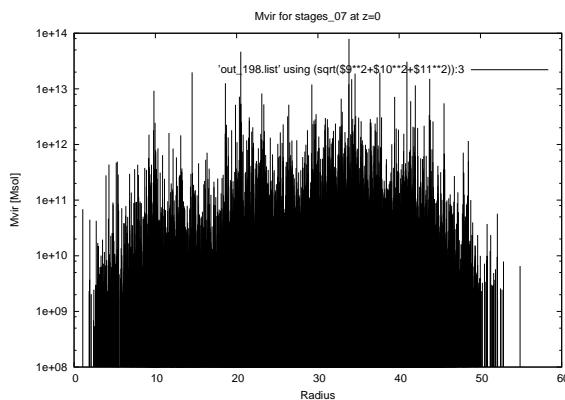
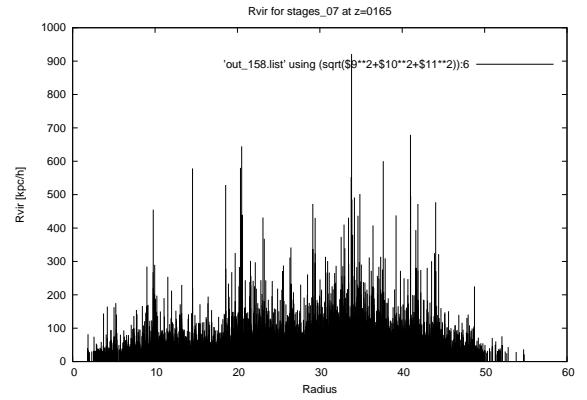
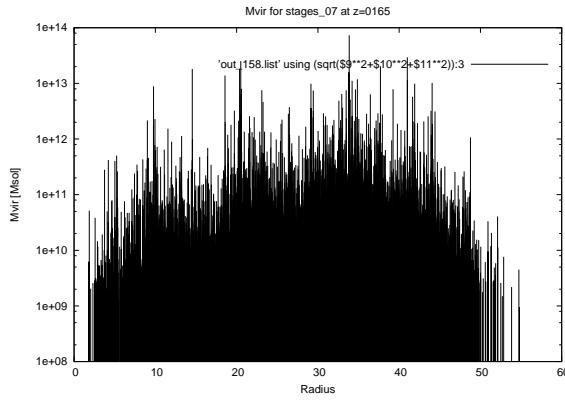
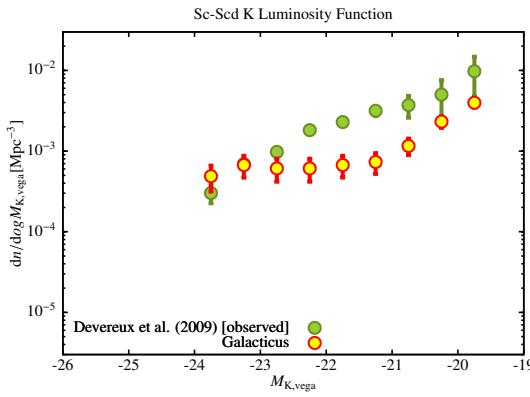
`stages_14` constraints + seed resimulated with different `linger.dat` in order to test its effect on SFR.



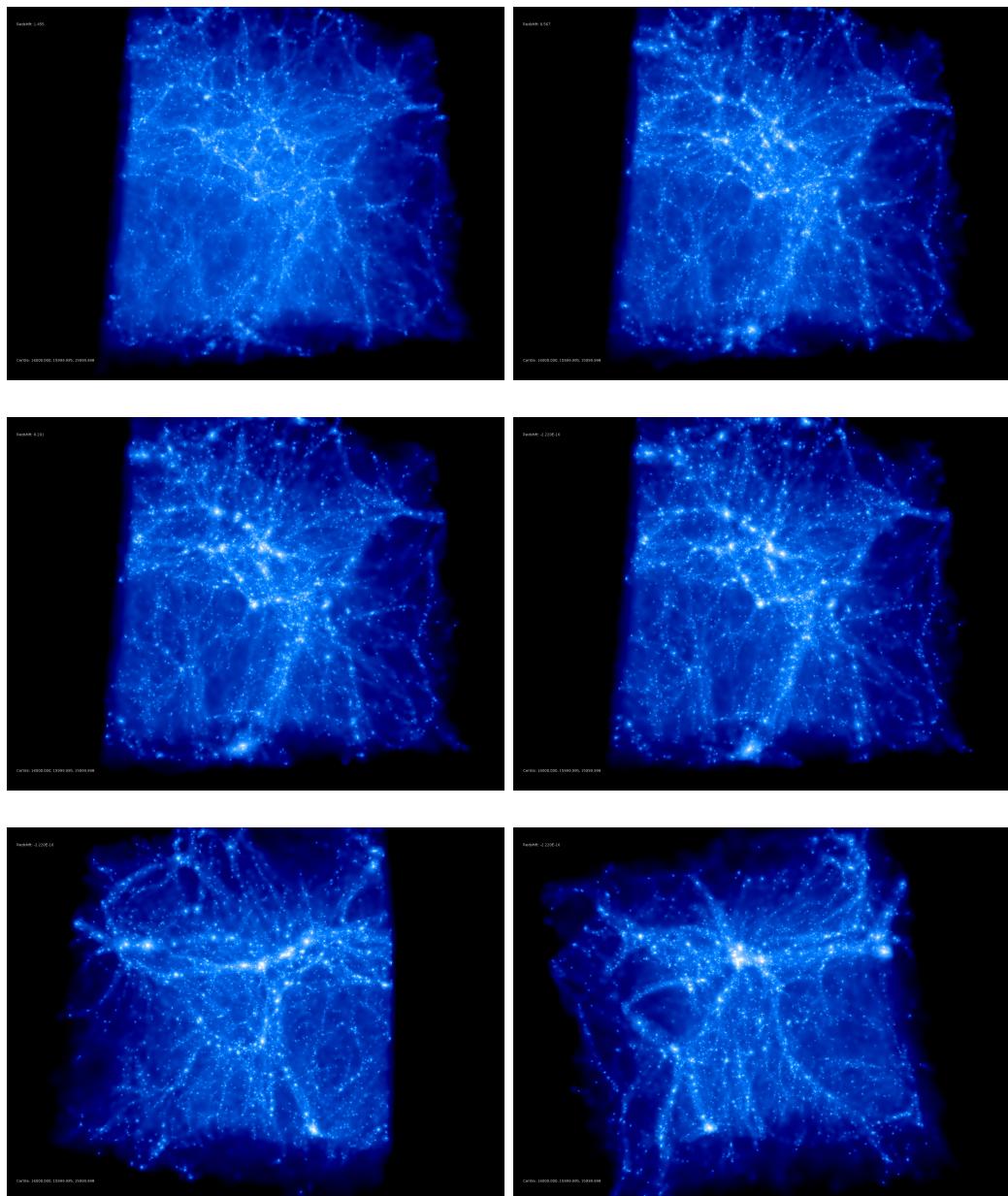


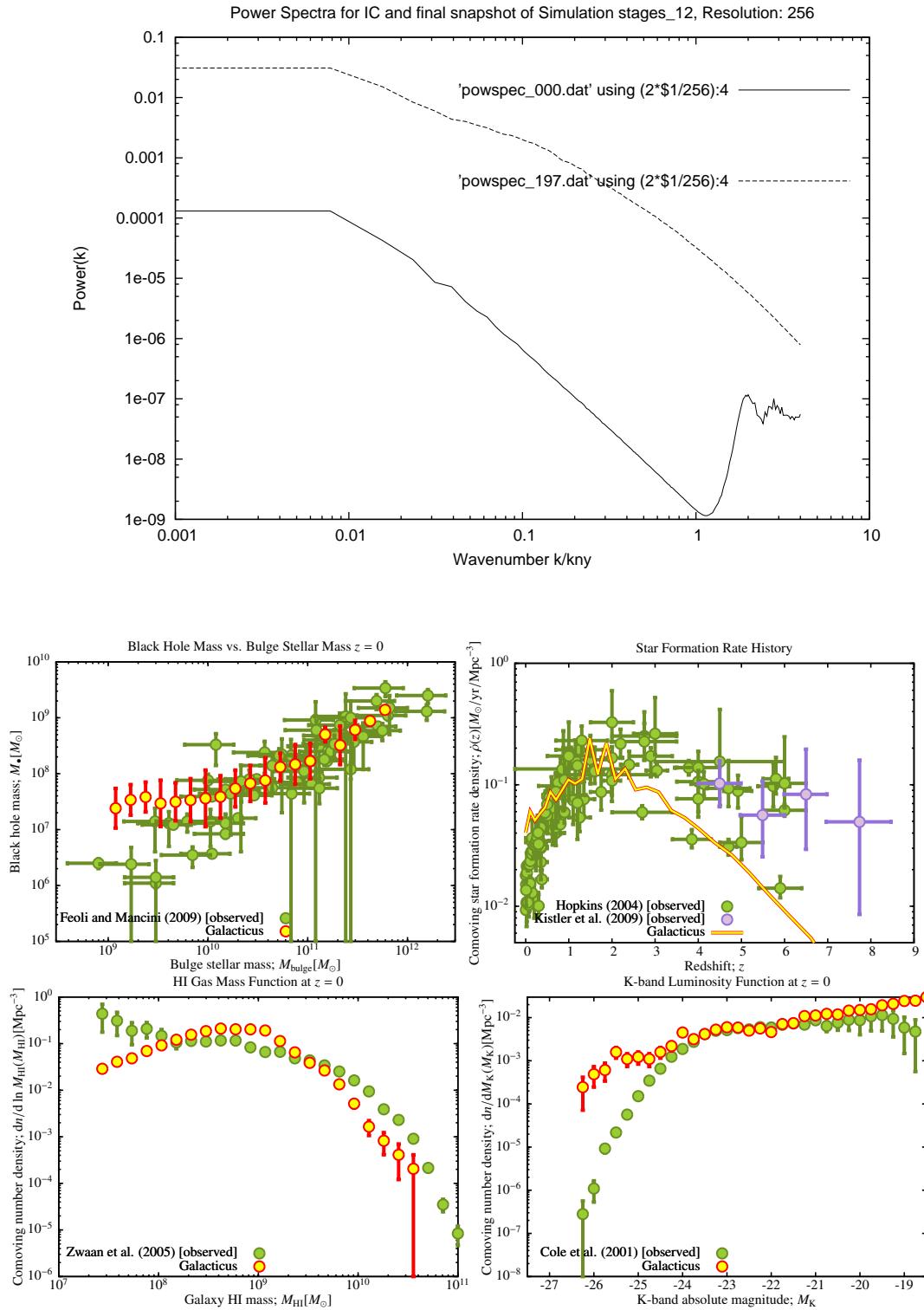
**stages\_07**

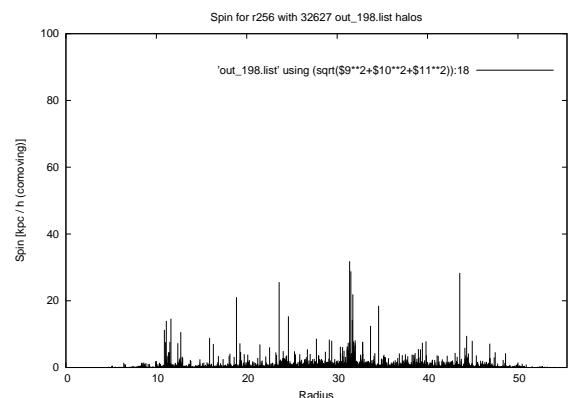
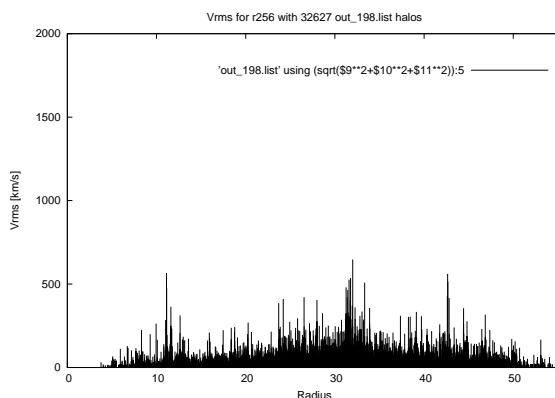
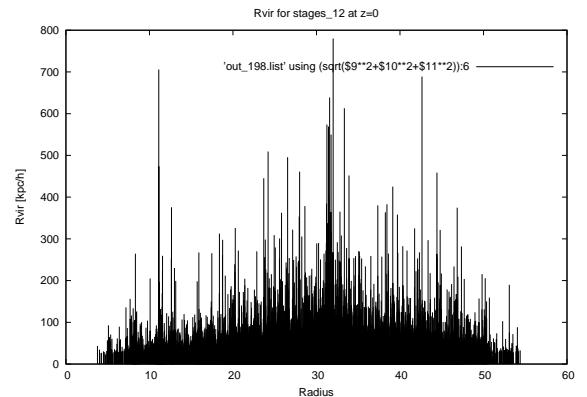
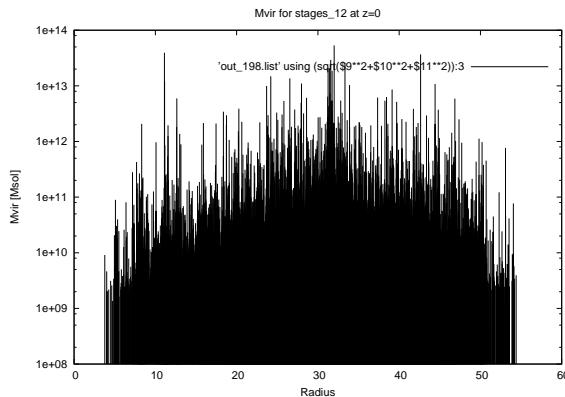
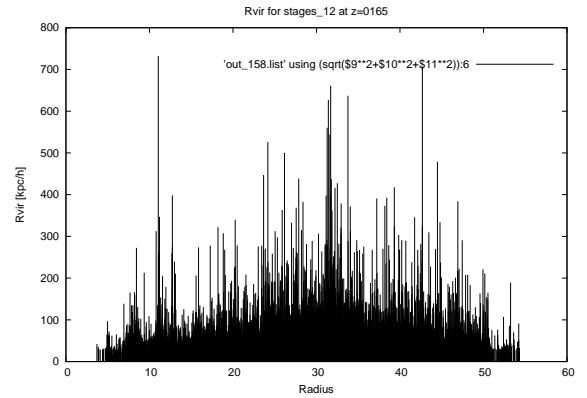
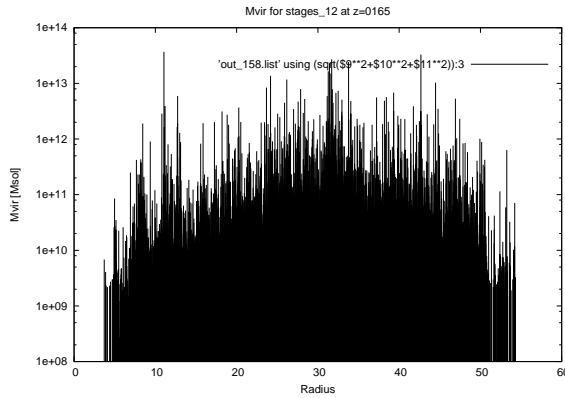
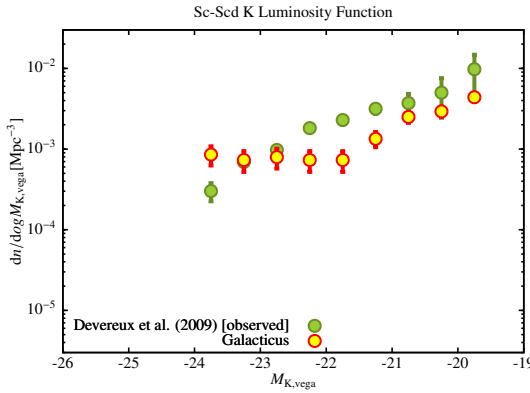




GALACTICUSSED ✓ CONSISTENTTREEED ✓  
ROCKSTARRED ✓

**stages\_12**





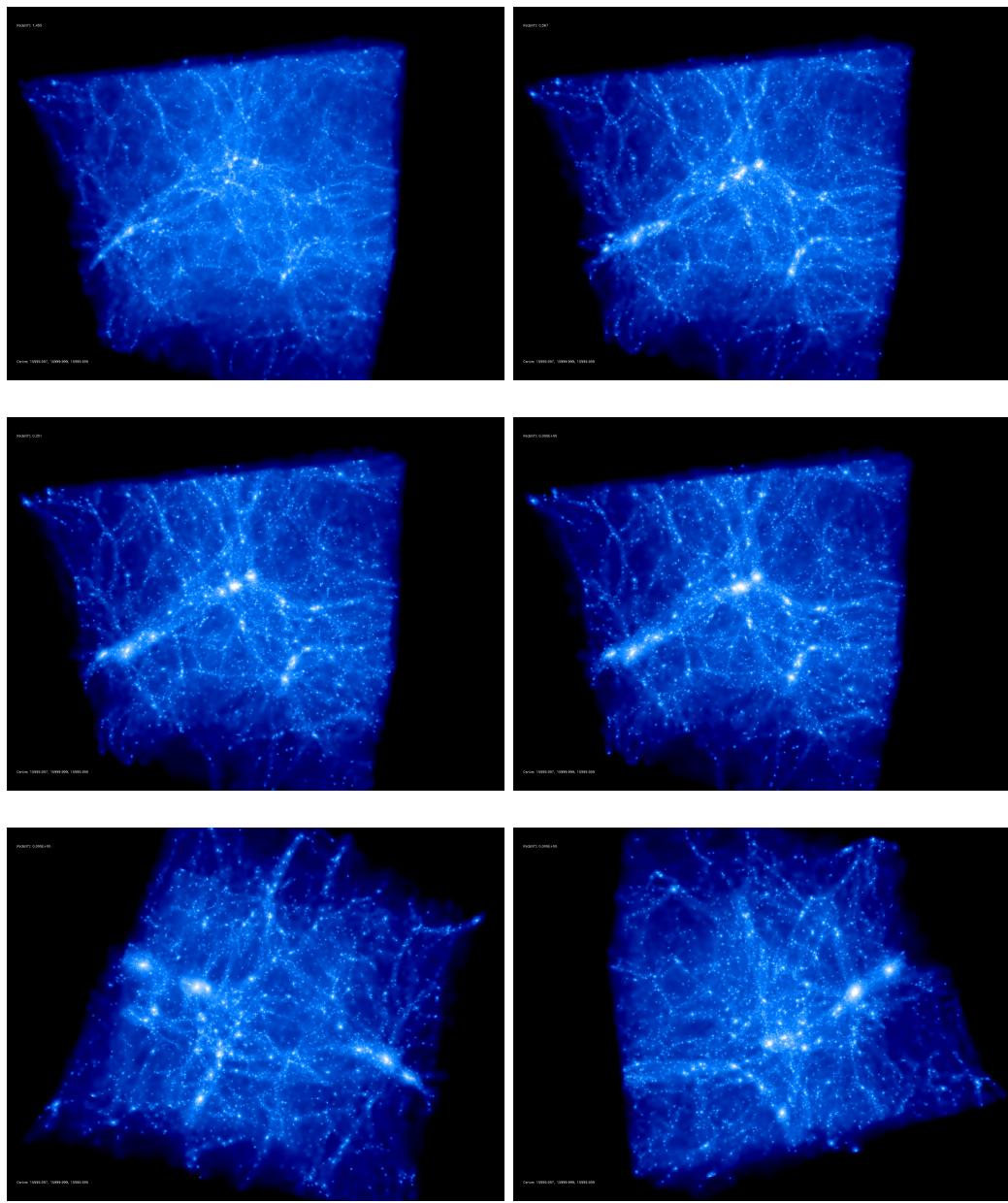
after Markus converter update is being galacticussed again  
galacticus strange error:

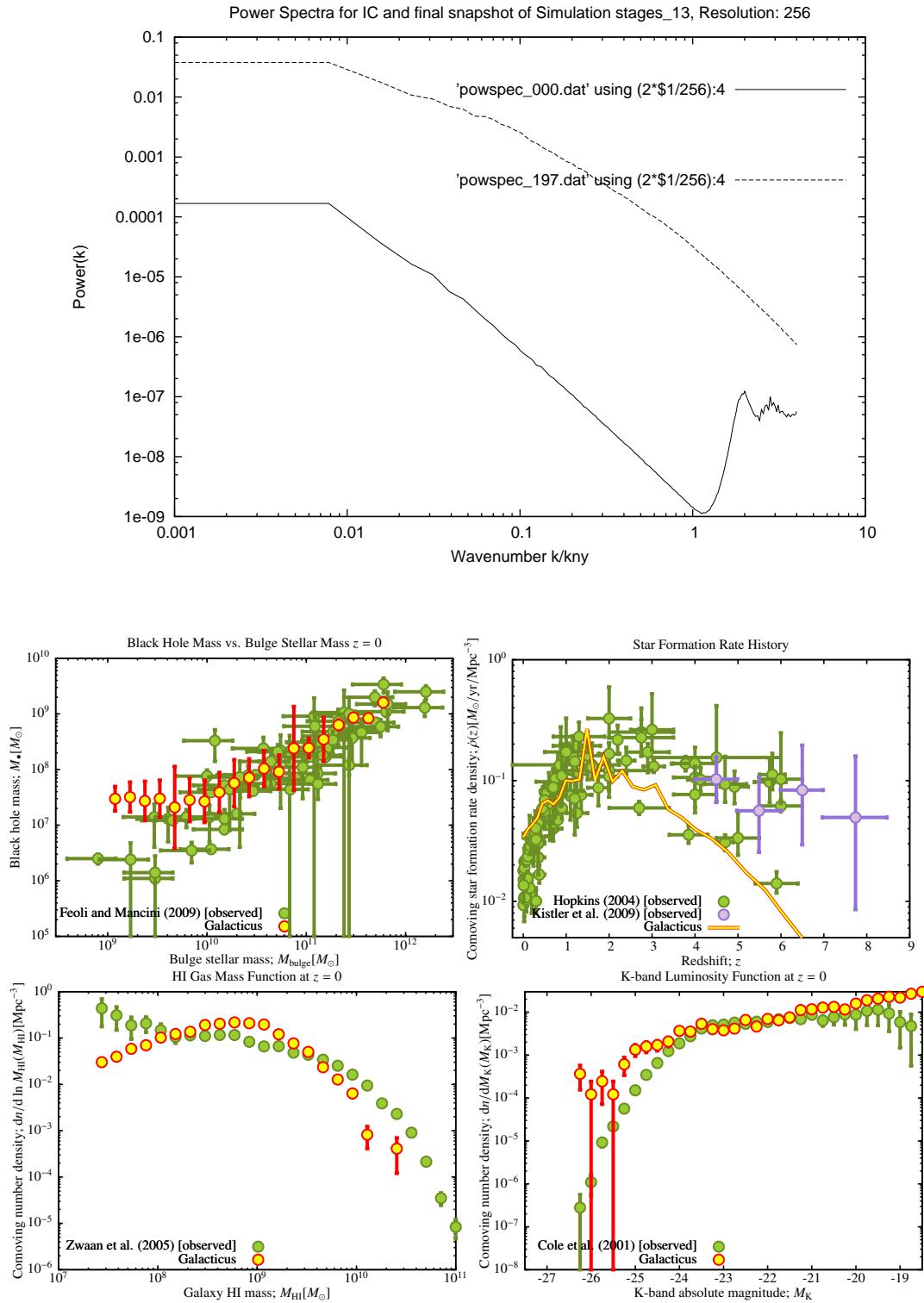
```
Fatal error in Cosmology_Age_Matter_Lambda():
expansion factor is invalid
```

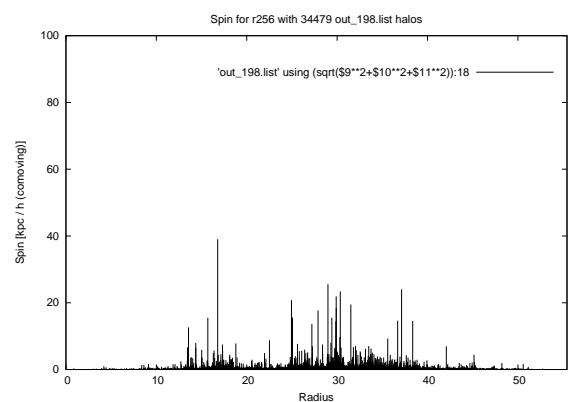
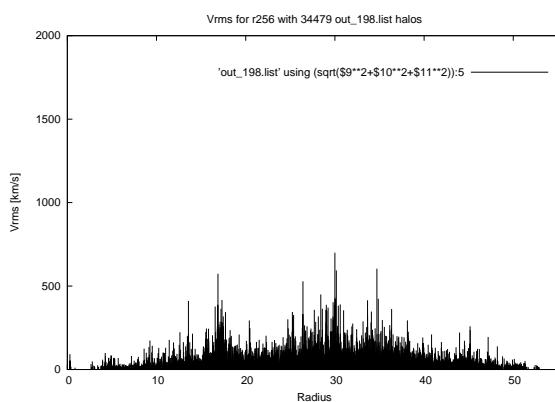
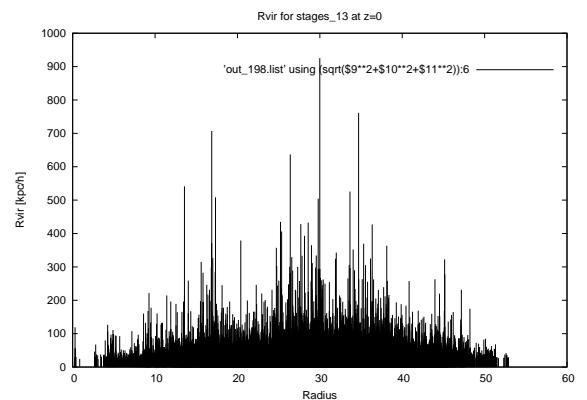
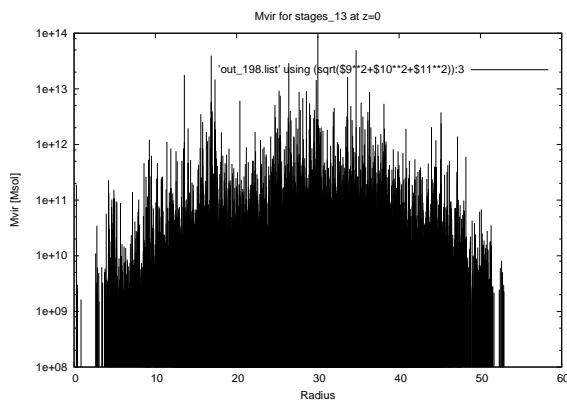
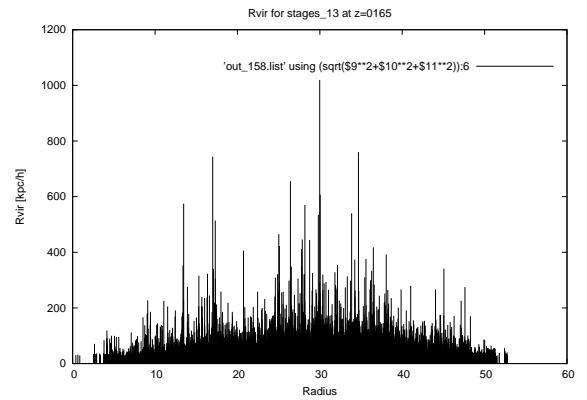
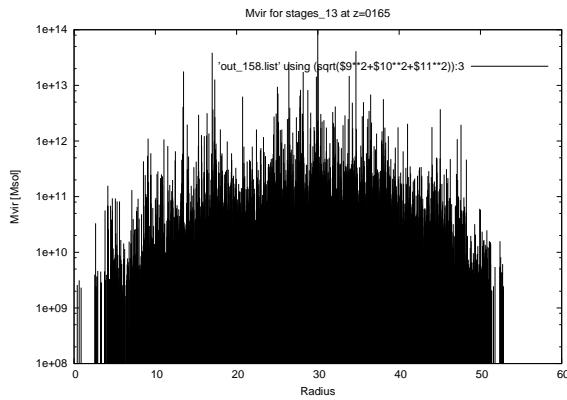
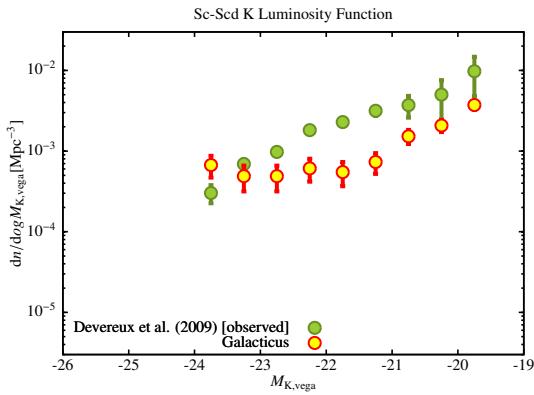
is being galacticussed

CONSISTENTTREED ✓

ROCKSTARRED ✓

**stages\_13**





GALACTICUSSED ✓

after Markus converter update is being galacticussed again  
galacticus strange error:

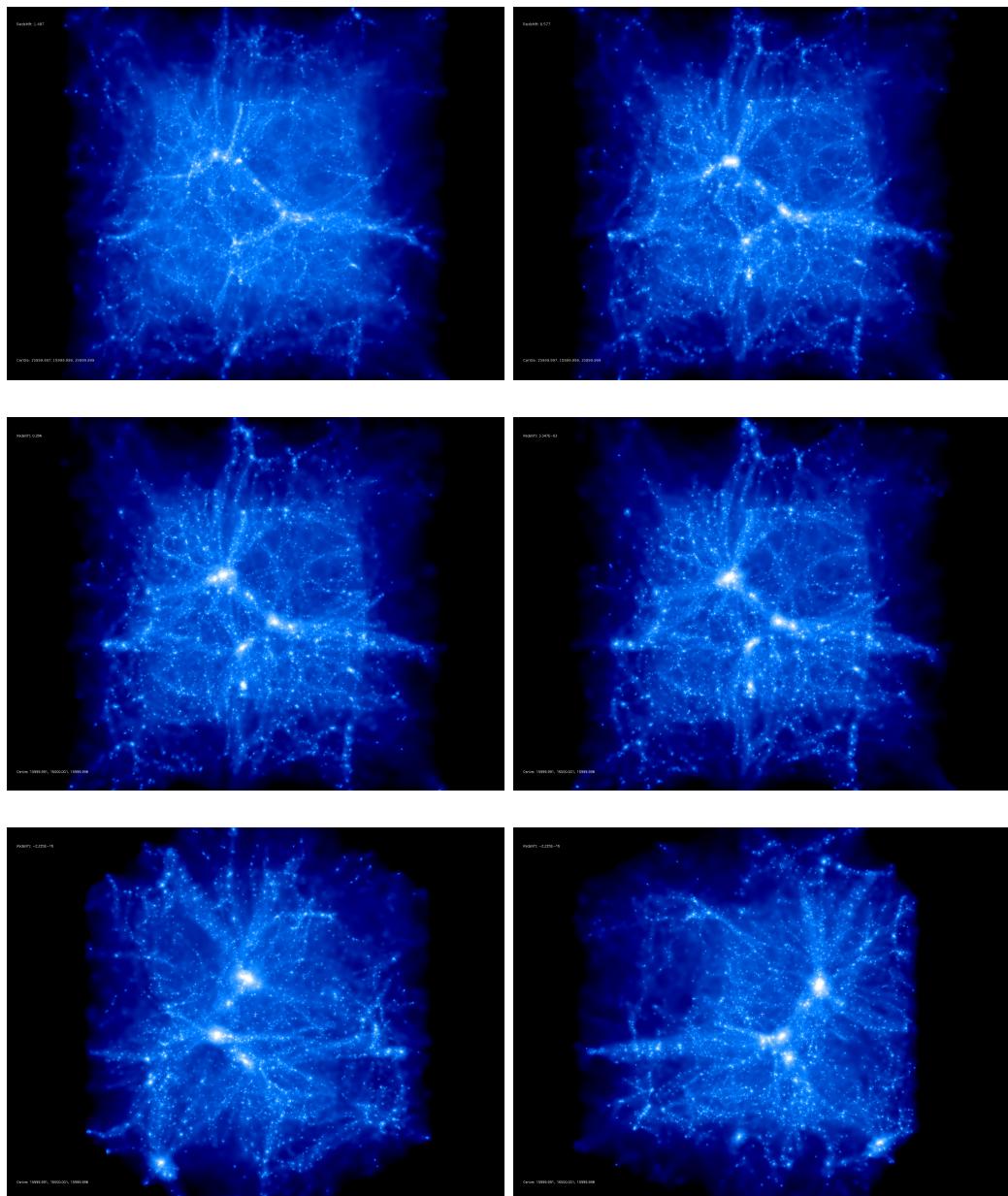
Fatal error in Cosmology\_Age\_Matter\_Lambda():  
expansion factor is invalid

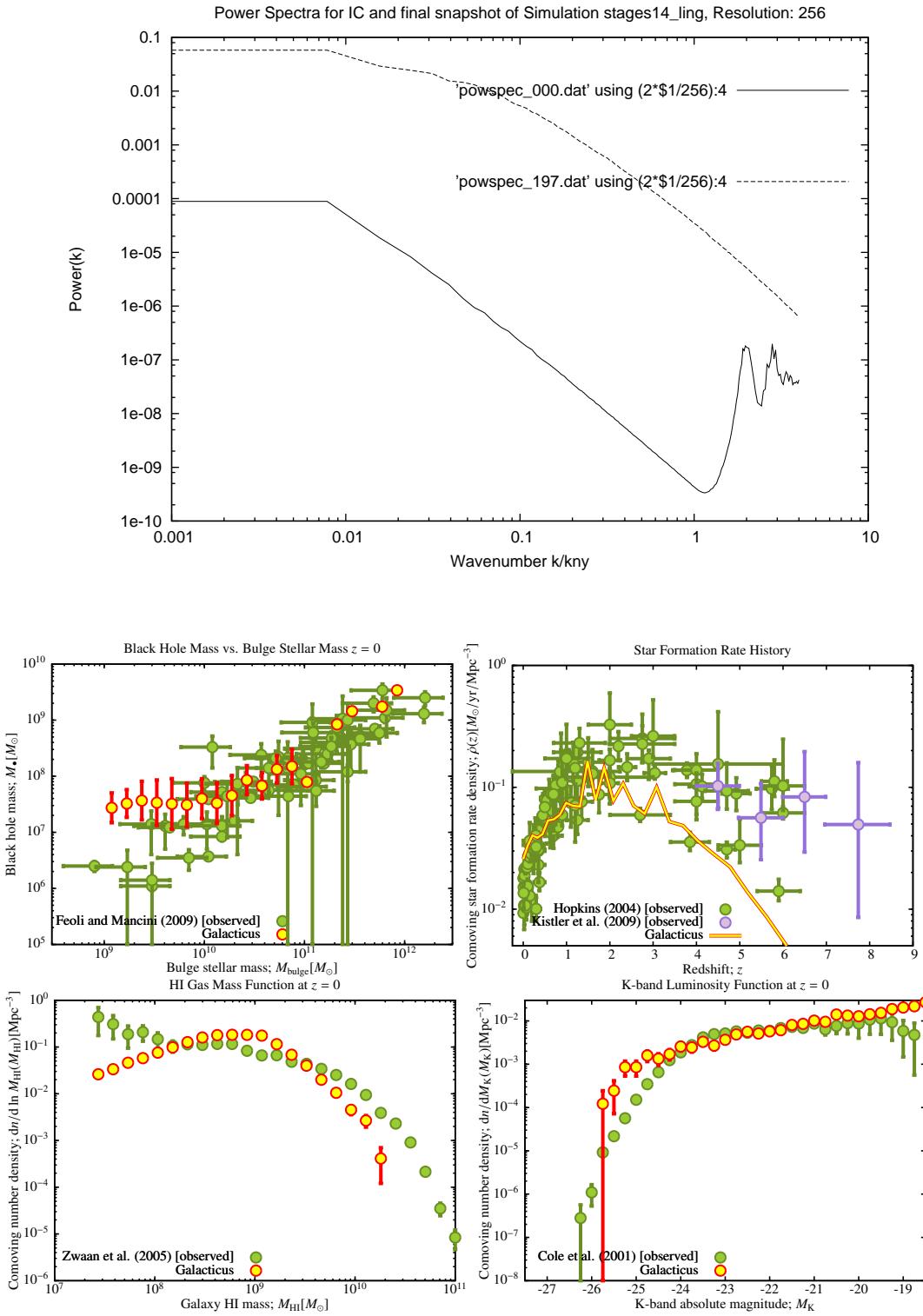
is being galacticussed

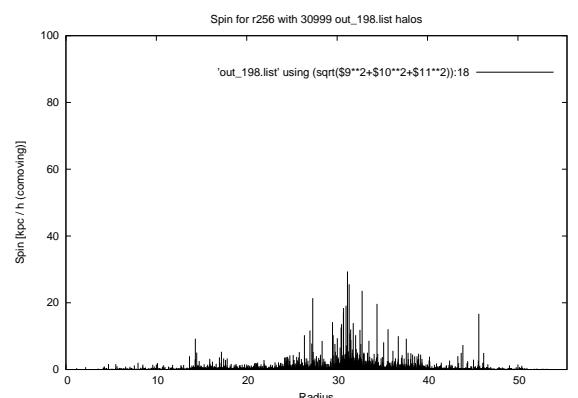
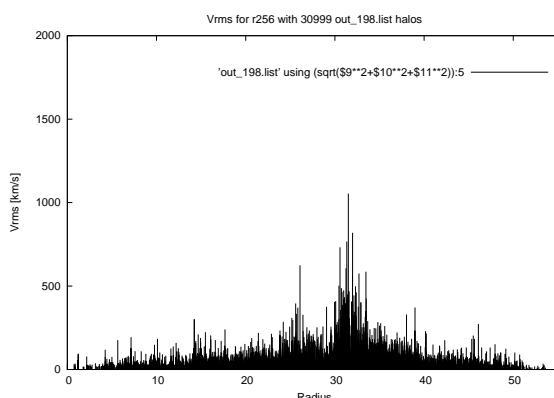
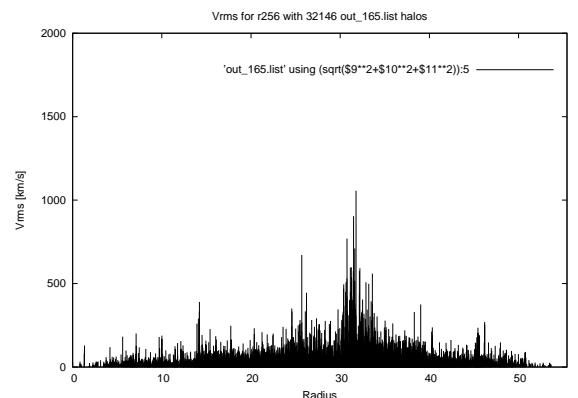
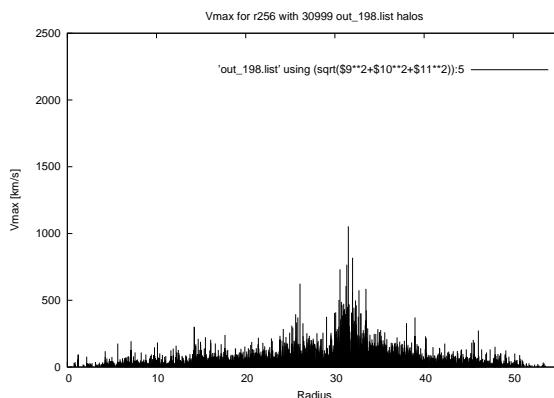
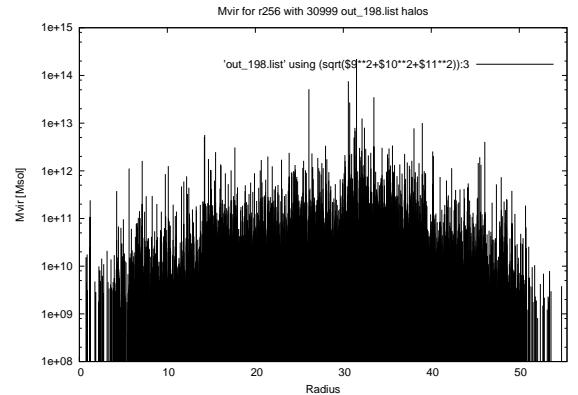
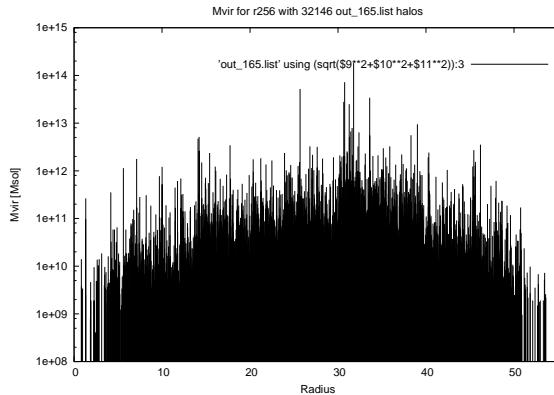
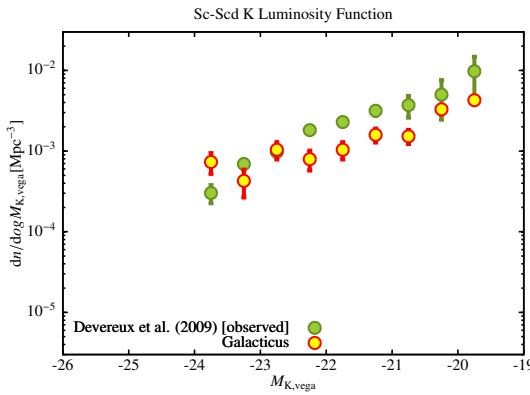
CONSISTENTTREED ✓

ROCKSTARRED ✓

stages14\_ling

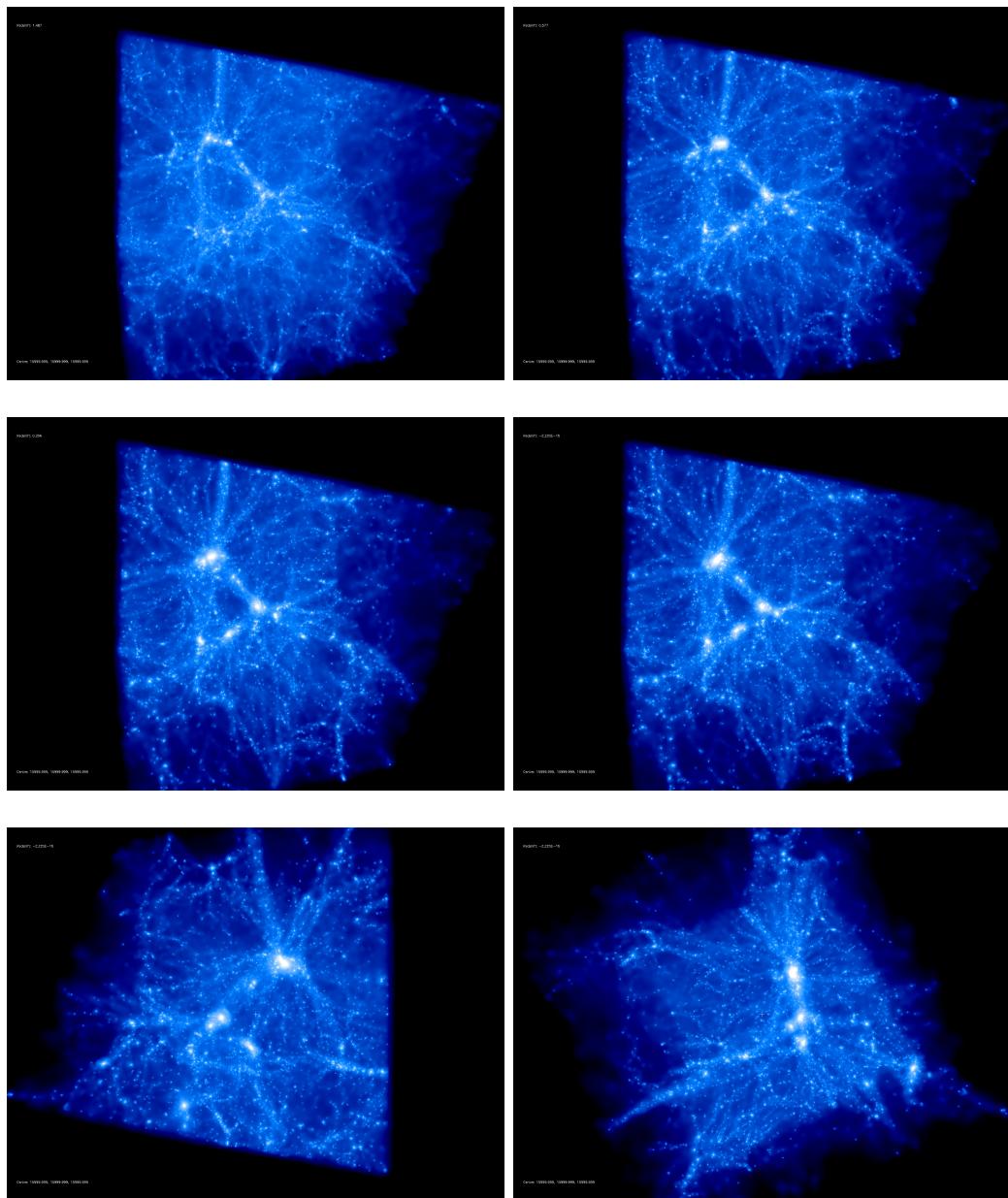


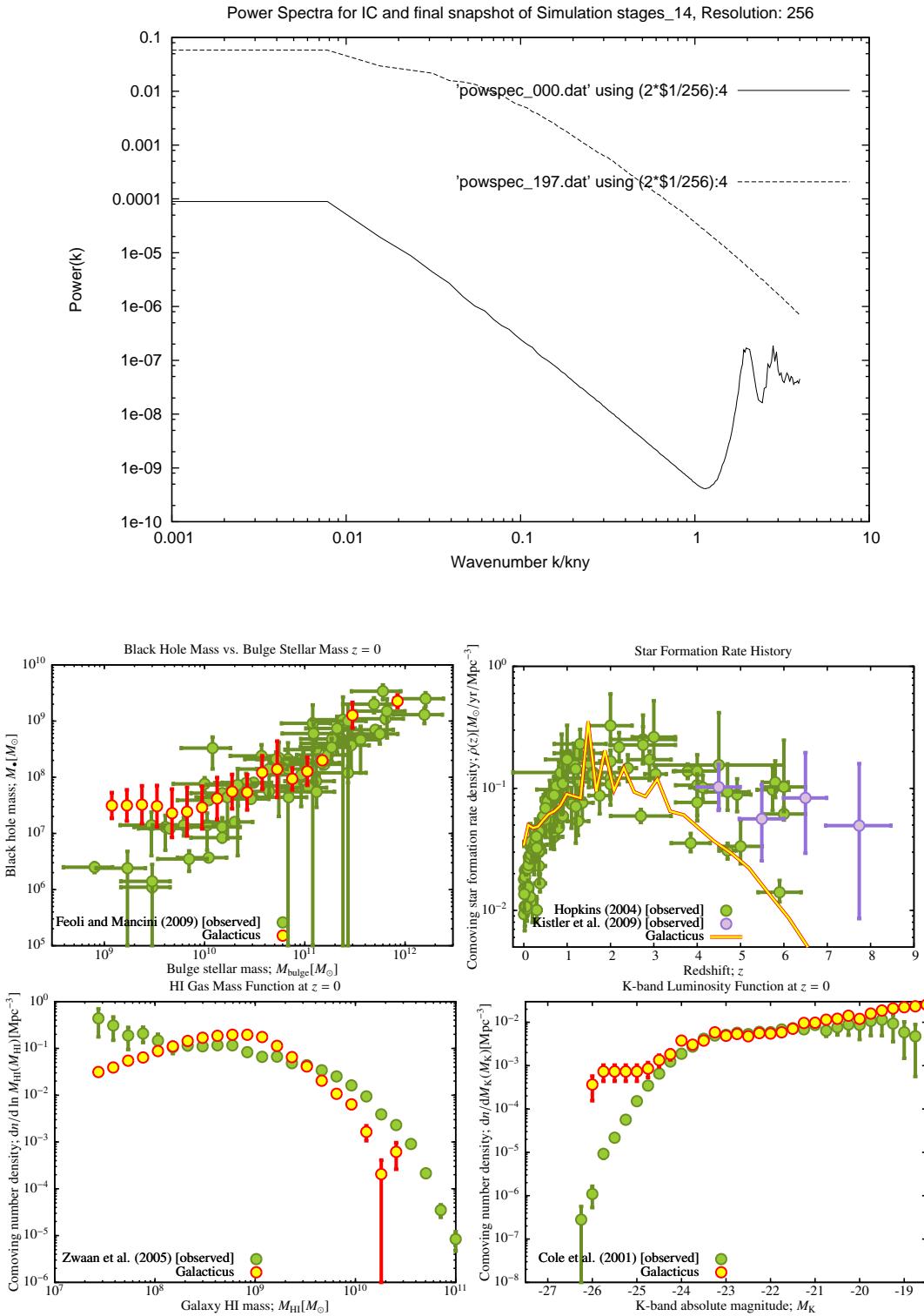


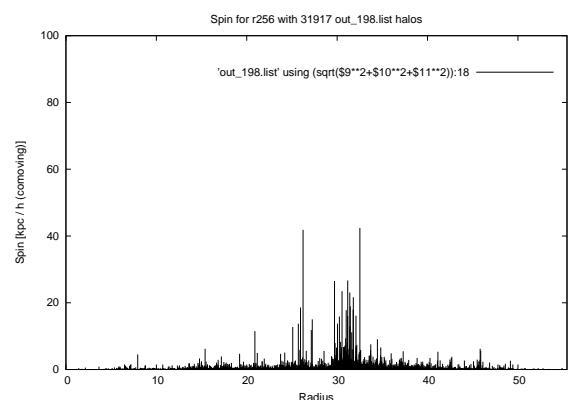
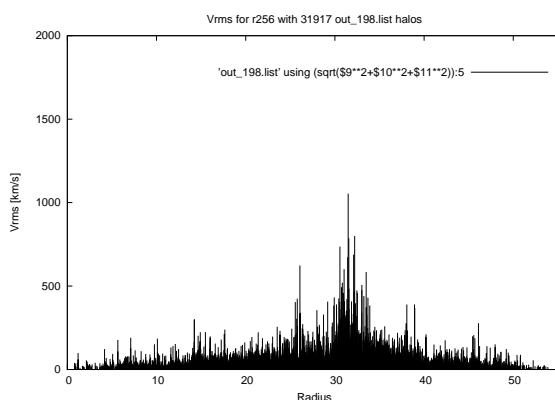
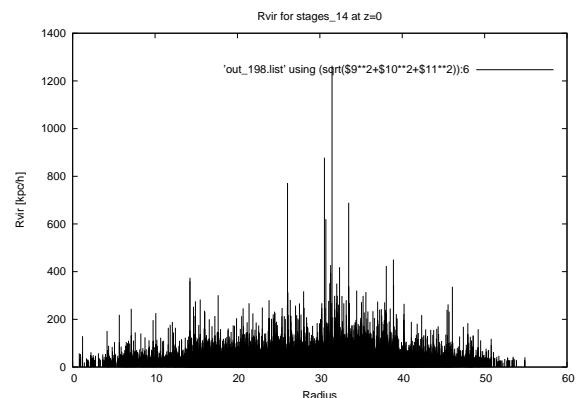
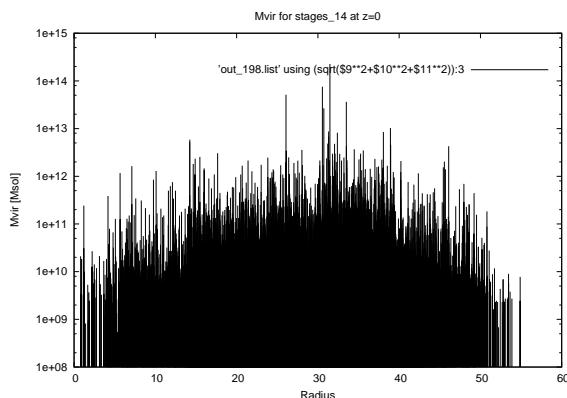
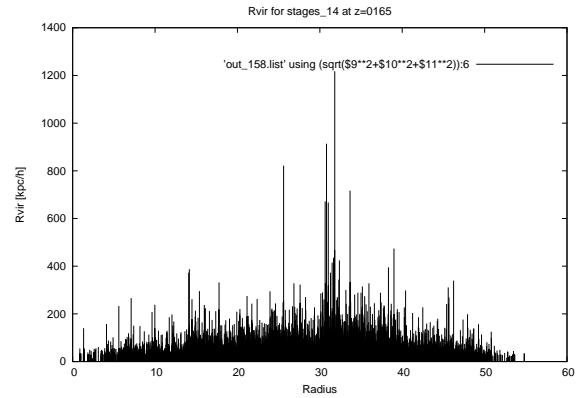
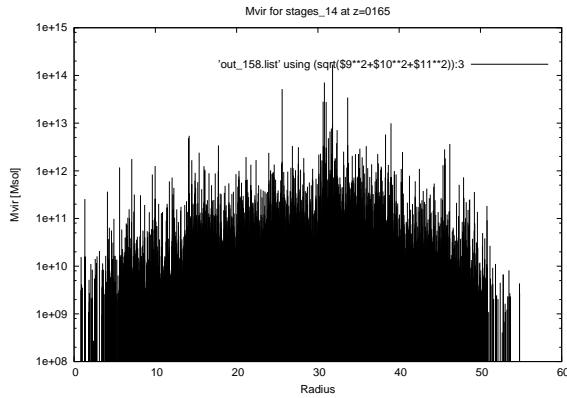
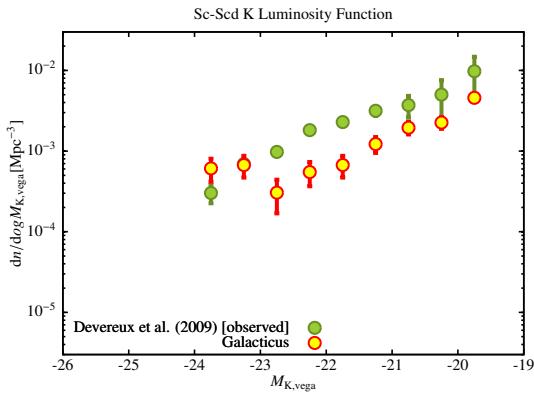


GALACTICUSSED ✓  
CONSISTENTTREED ✓  
ROCKSTARRED ✓

stages\_14

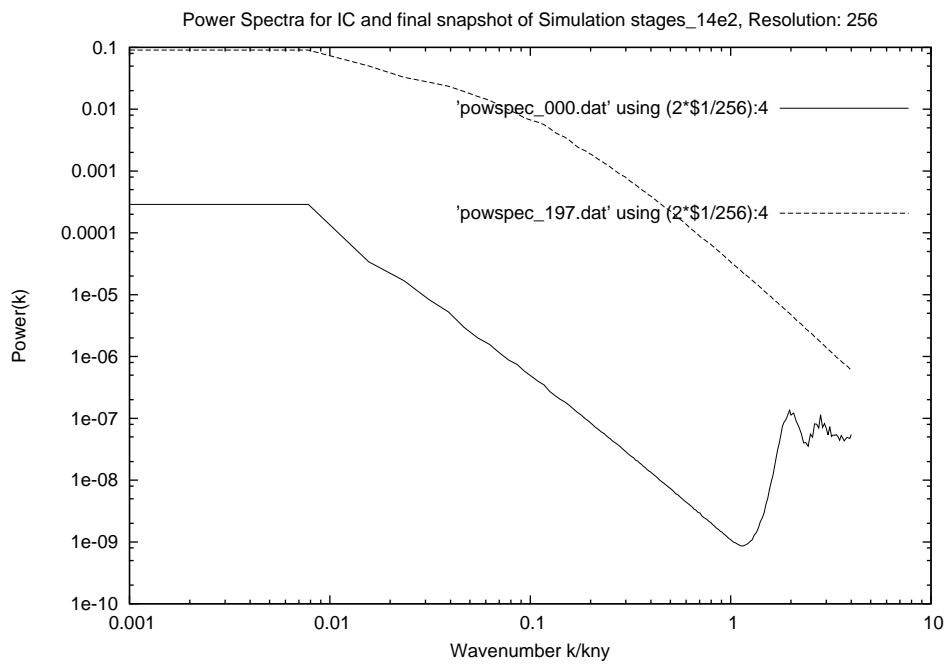


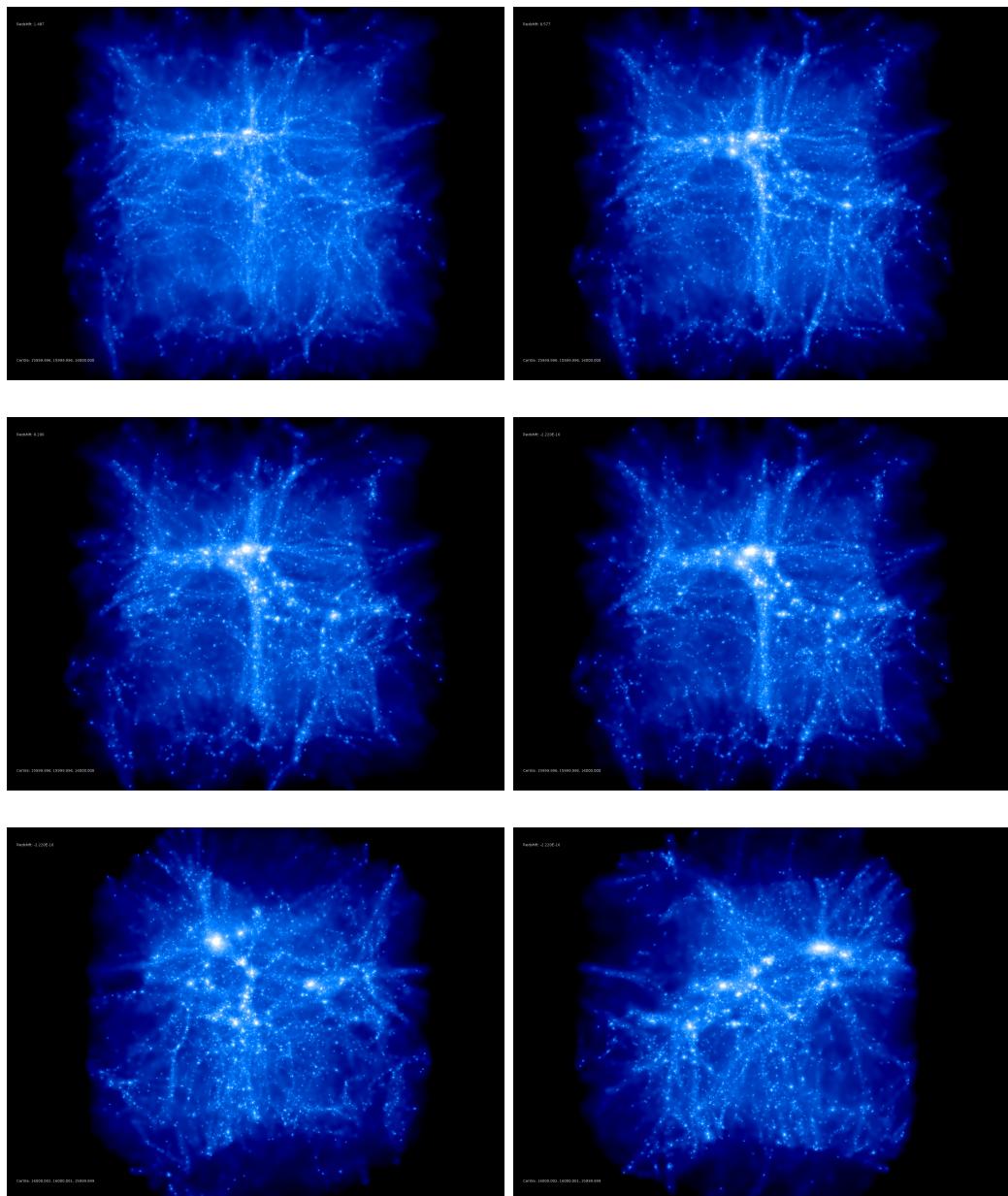


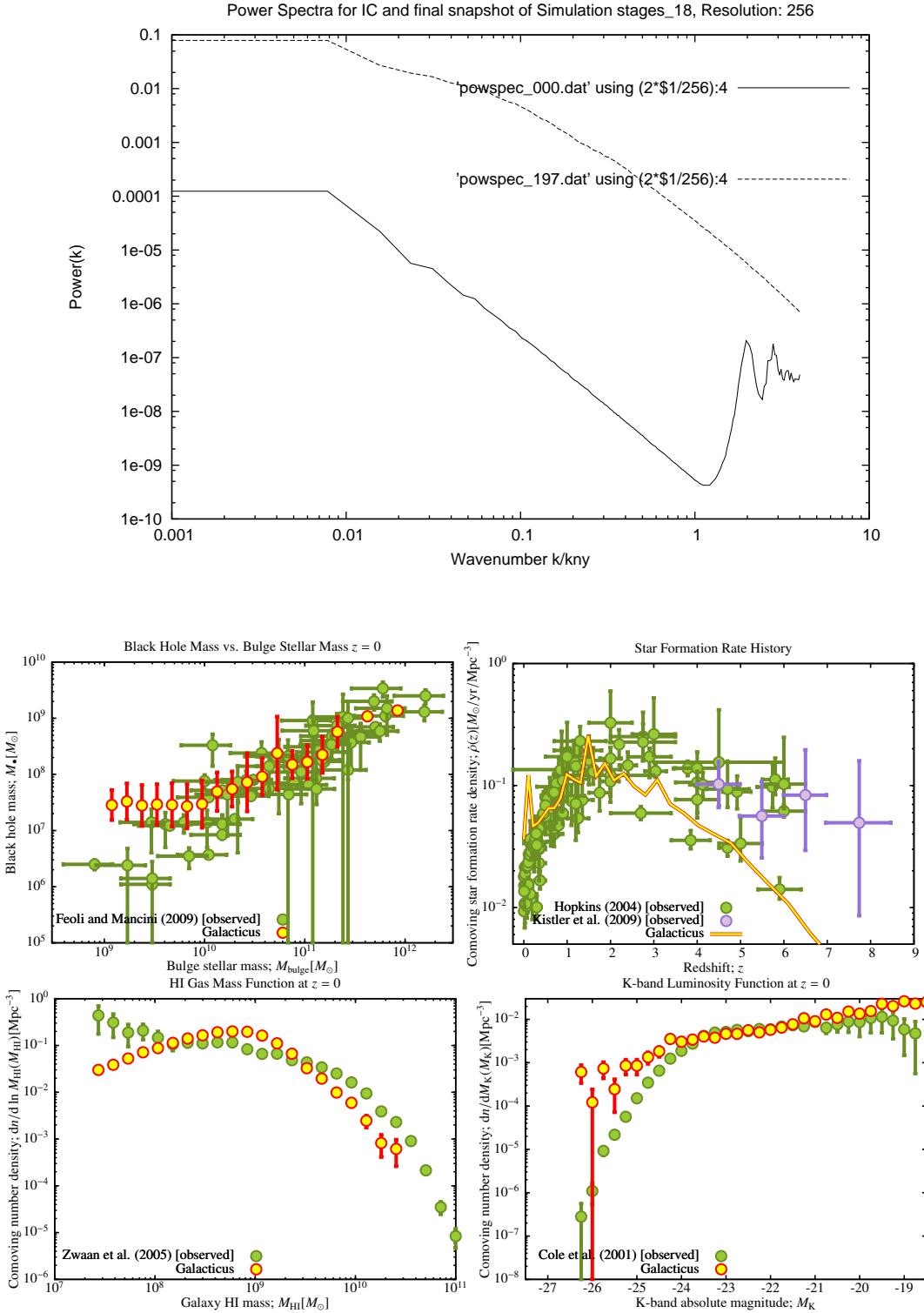


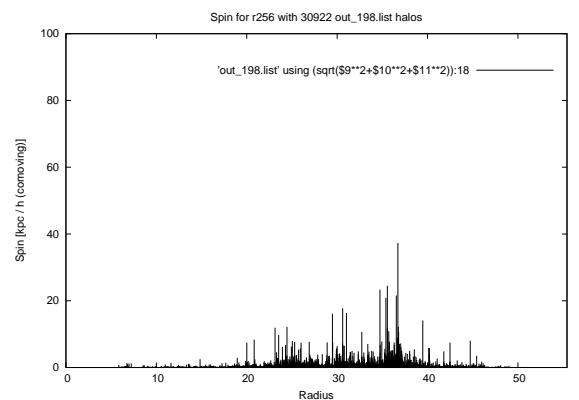
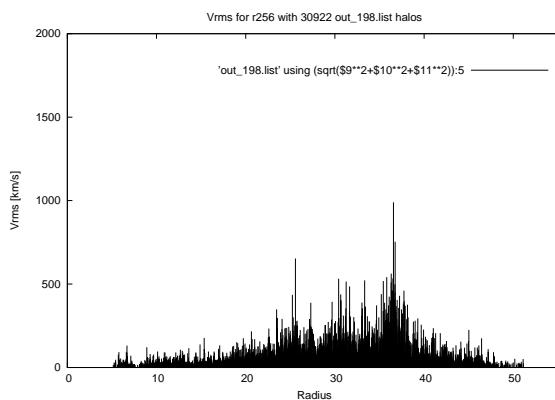
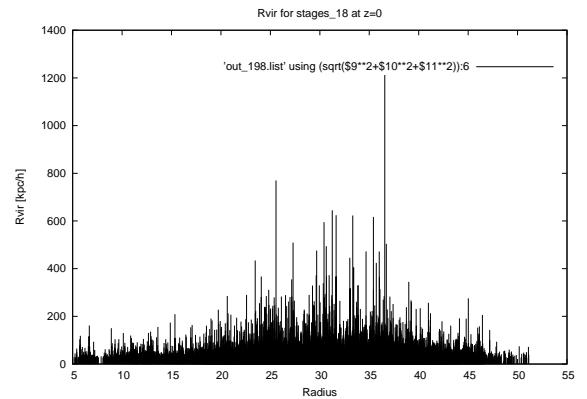
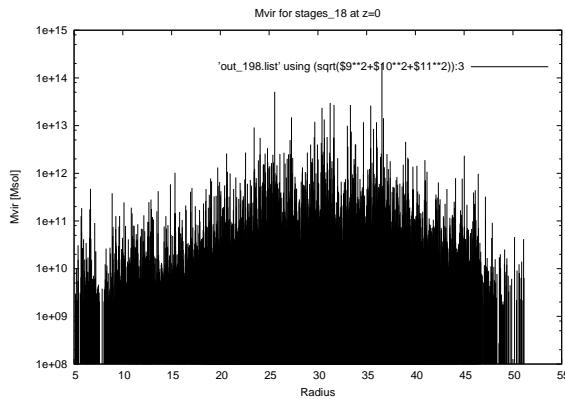
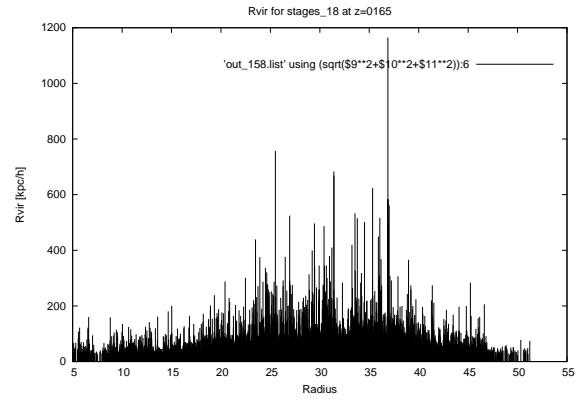
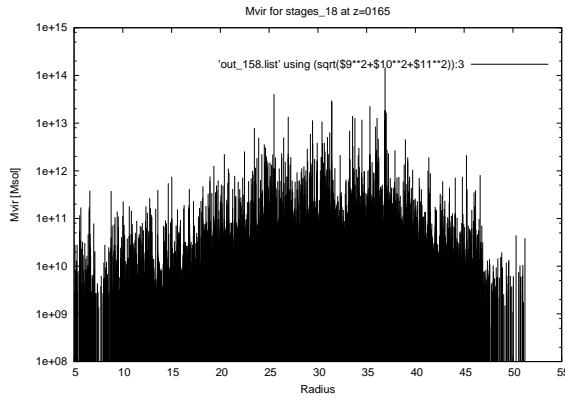
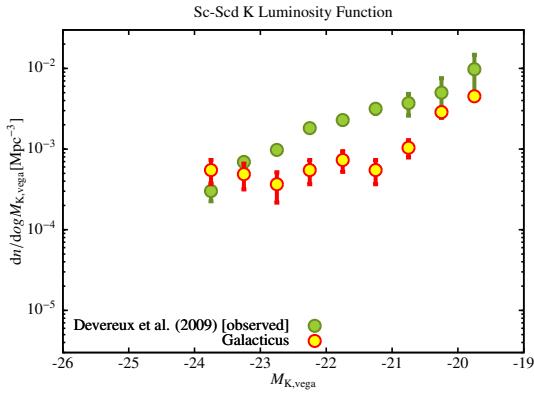
GALACTICUSSED ✓  
CONSISTENTTREED ✓  
ROCKSTARRED ✓

stages\_14e



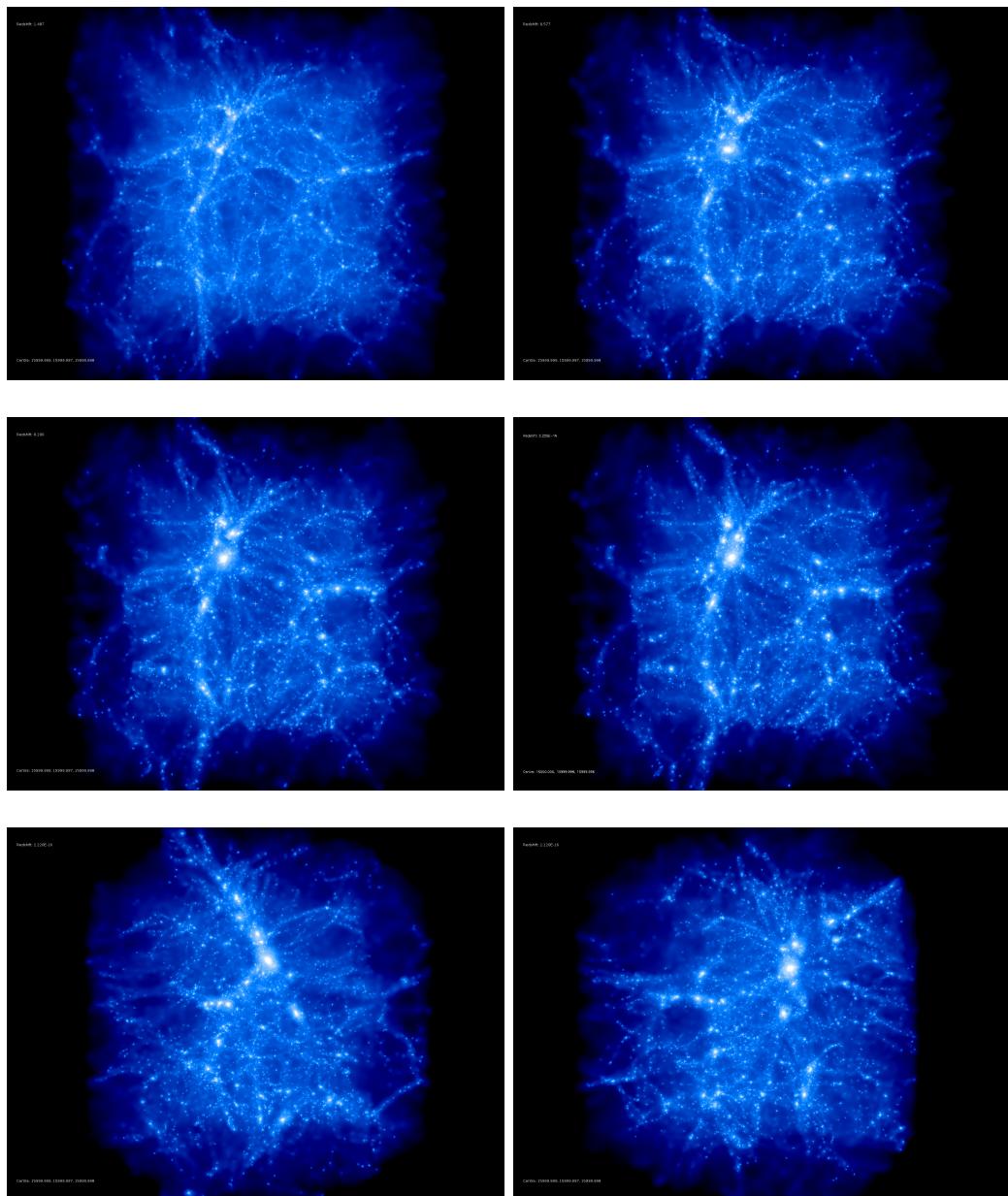
**stages\_18**

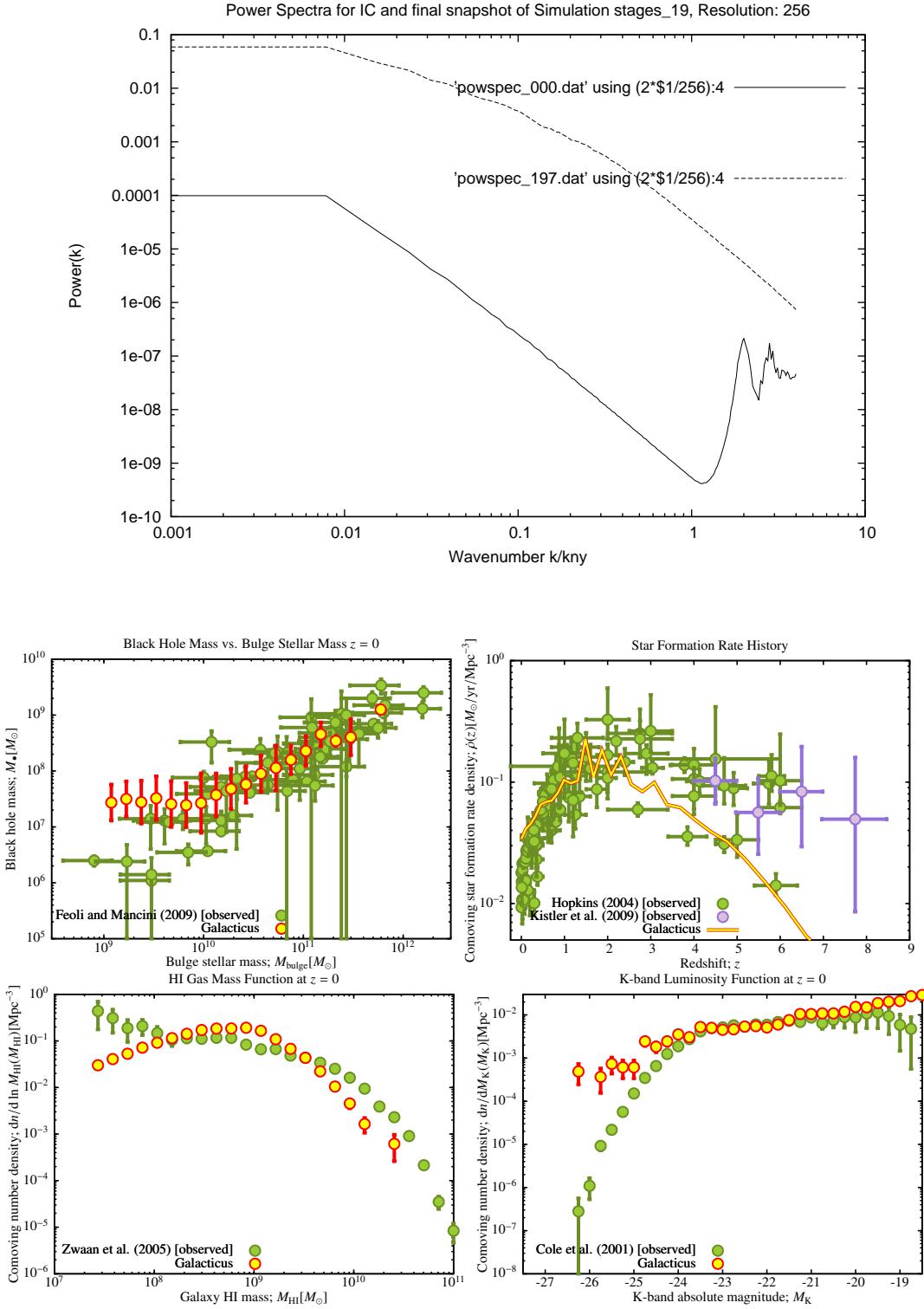


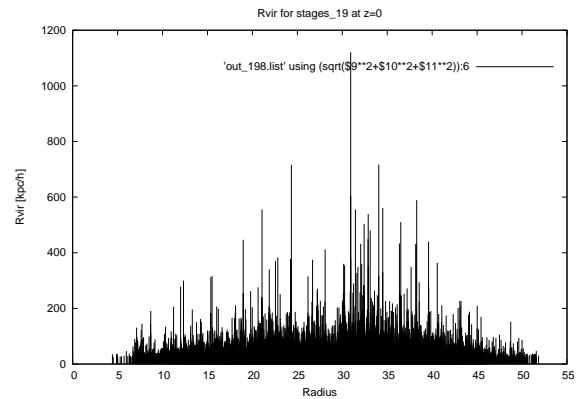
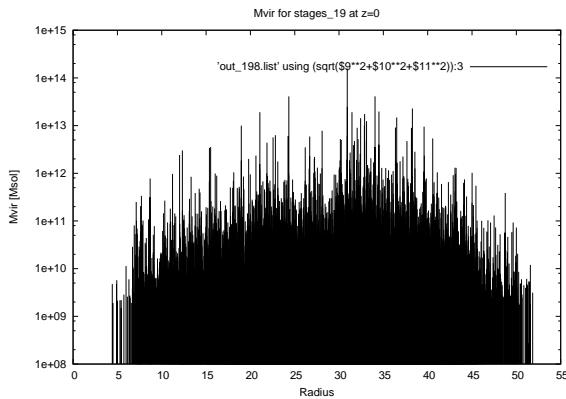
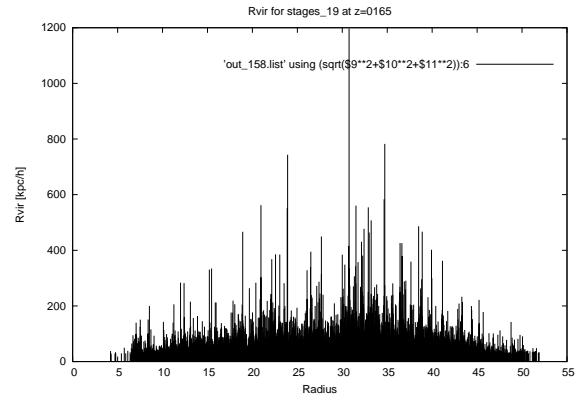
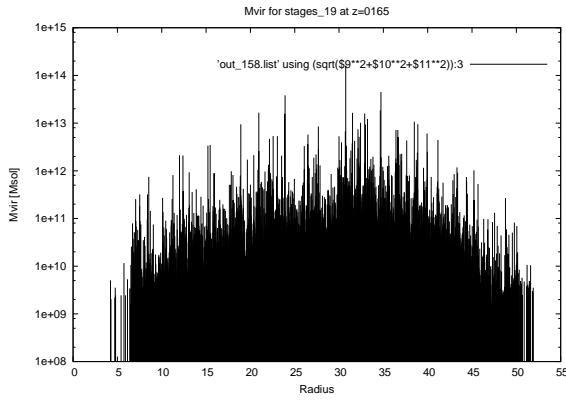
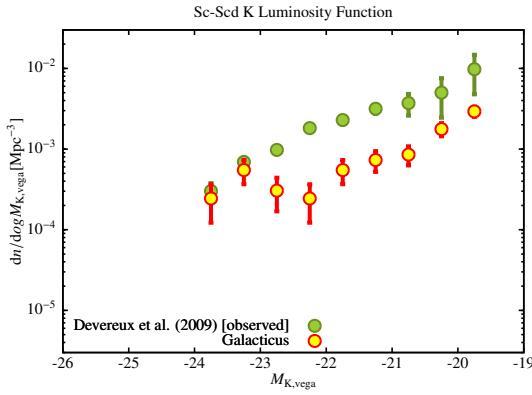


GALACTICUSSED ✓  
CONSISTENTTREED ✓  
ROCKSTARRED ✓

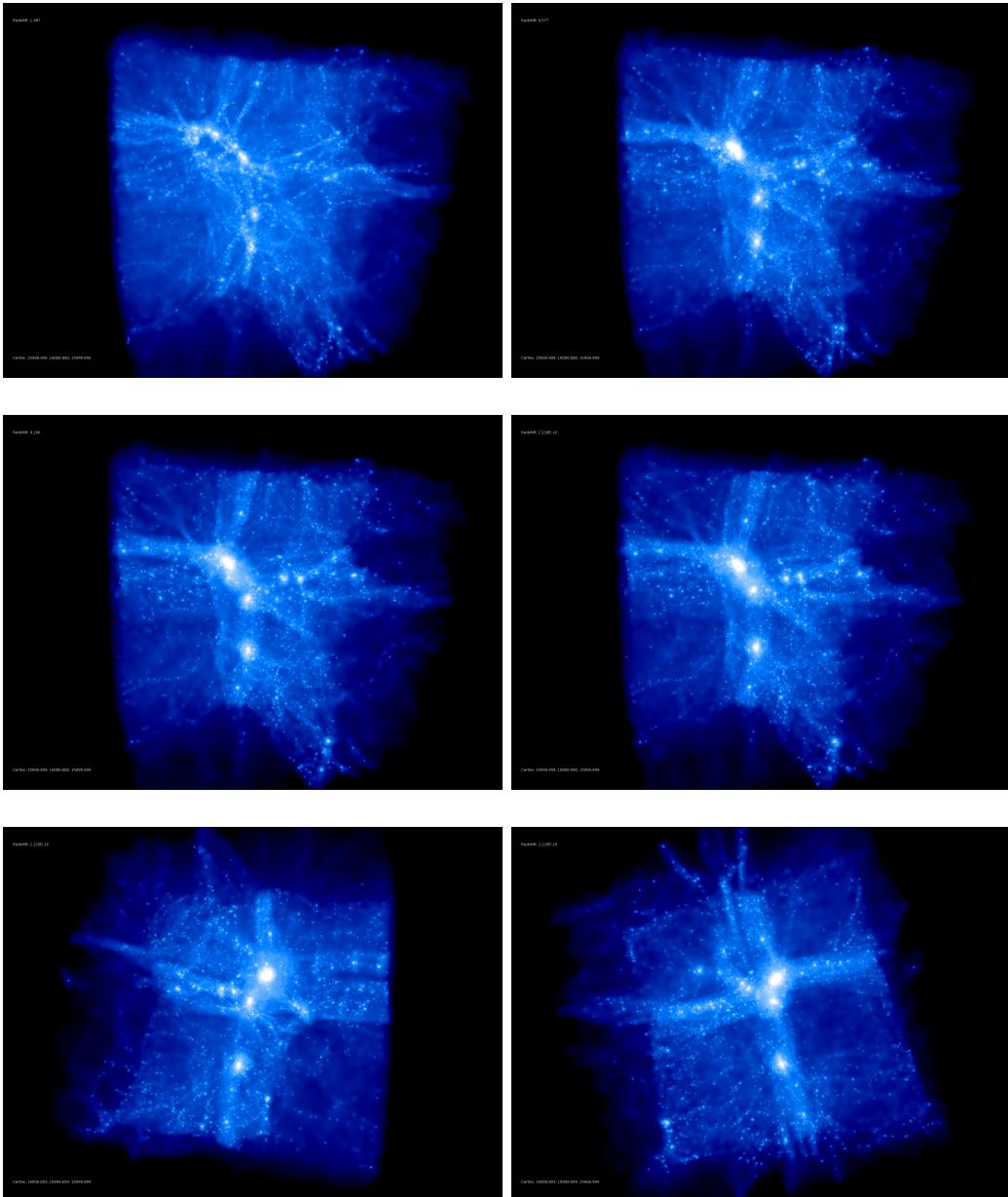
stages\_19

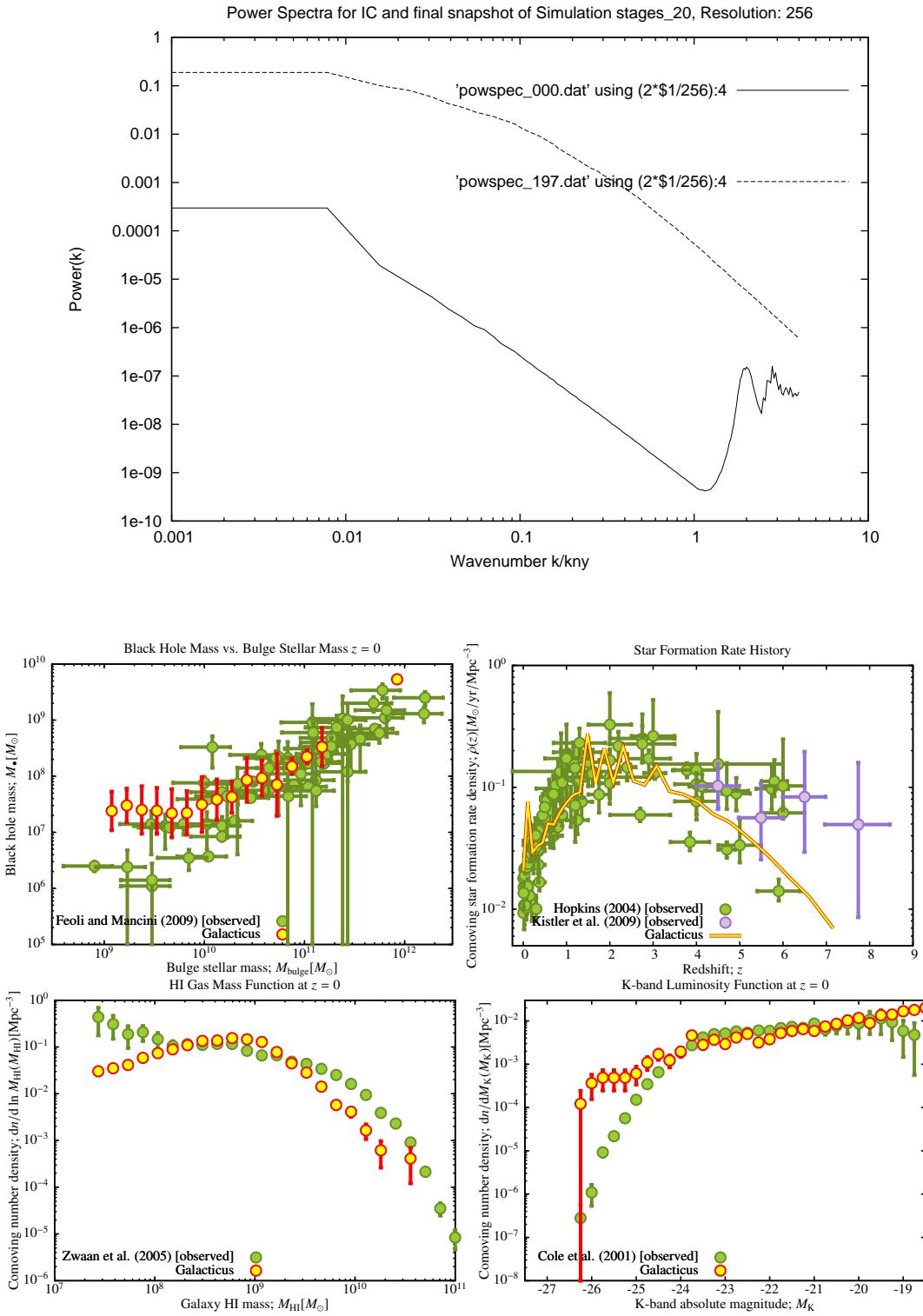


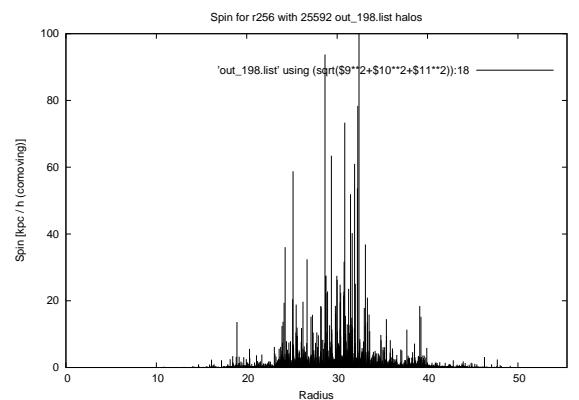
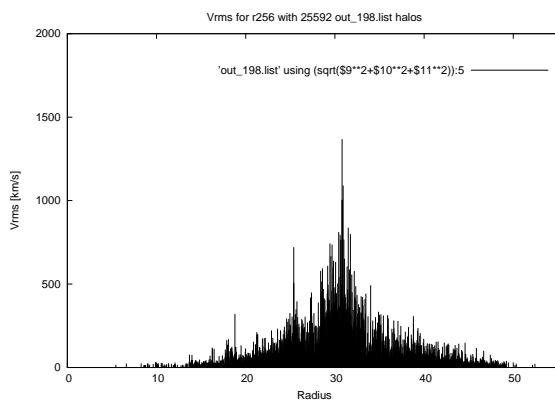
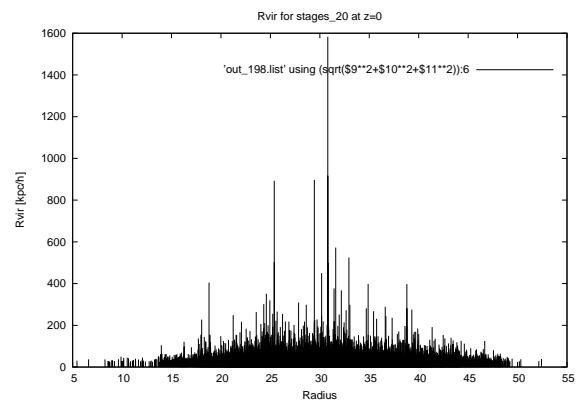
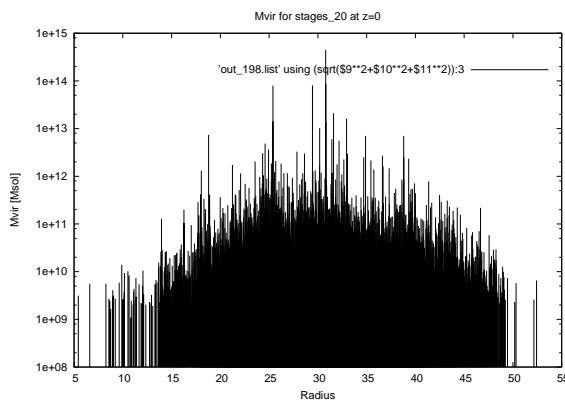
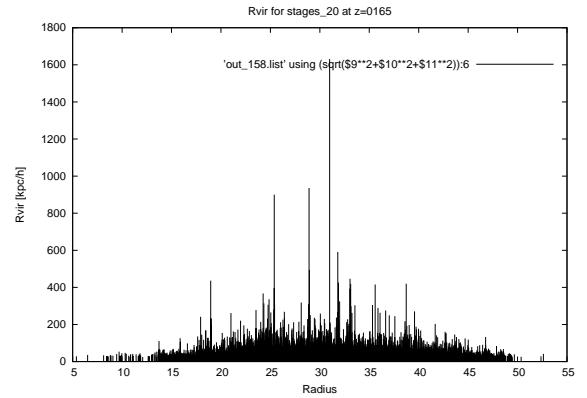
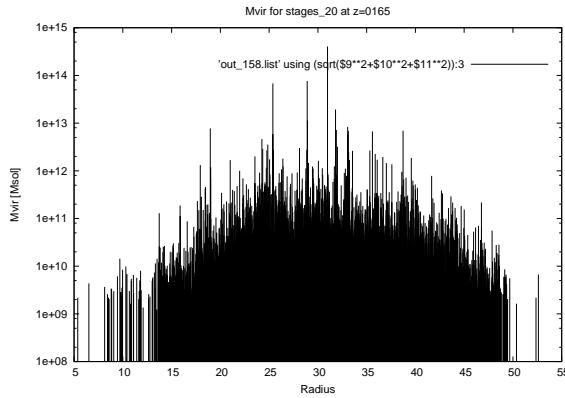
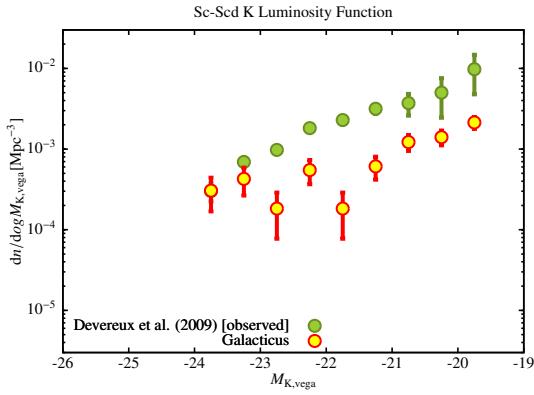




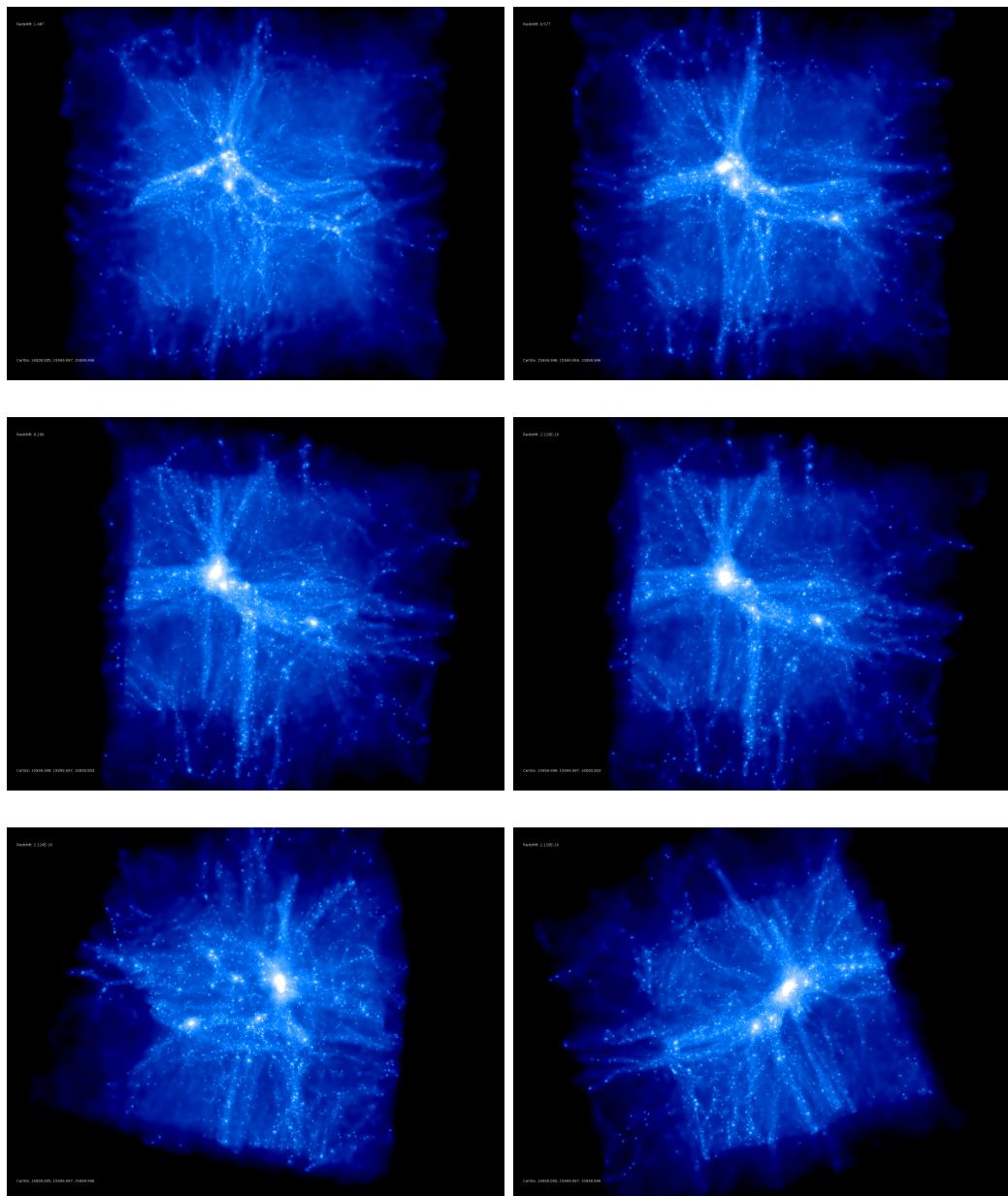
GALACTICUSSED ✓  
 CONSISTENTTREED ✓  
 ROCKSTARRED ✓

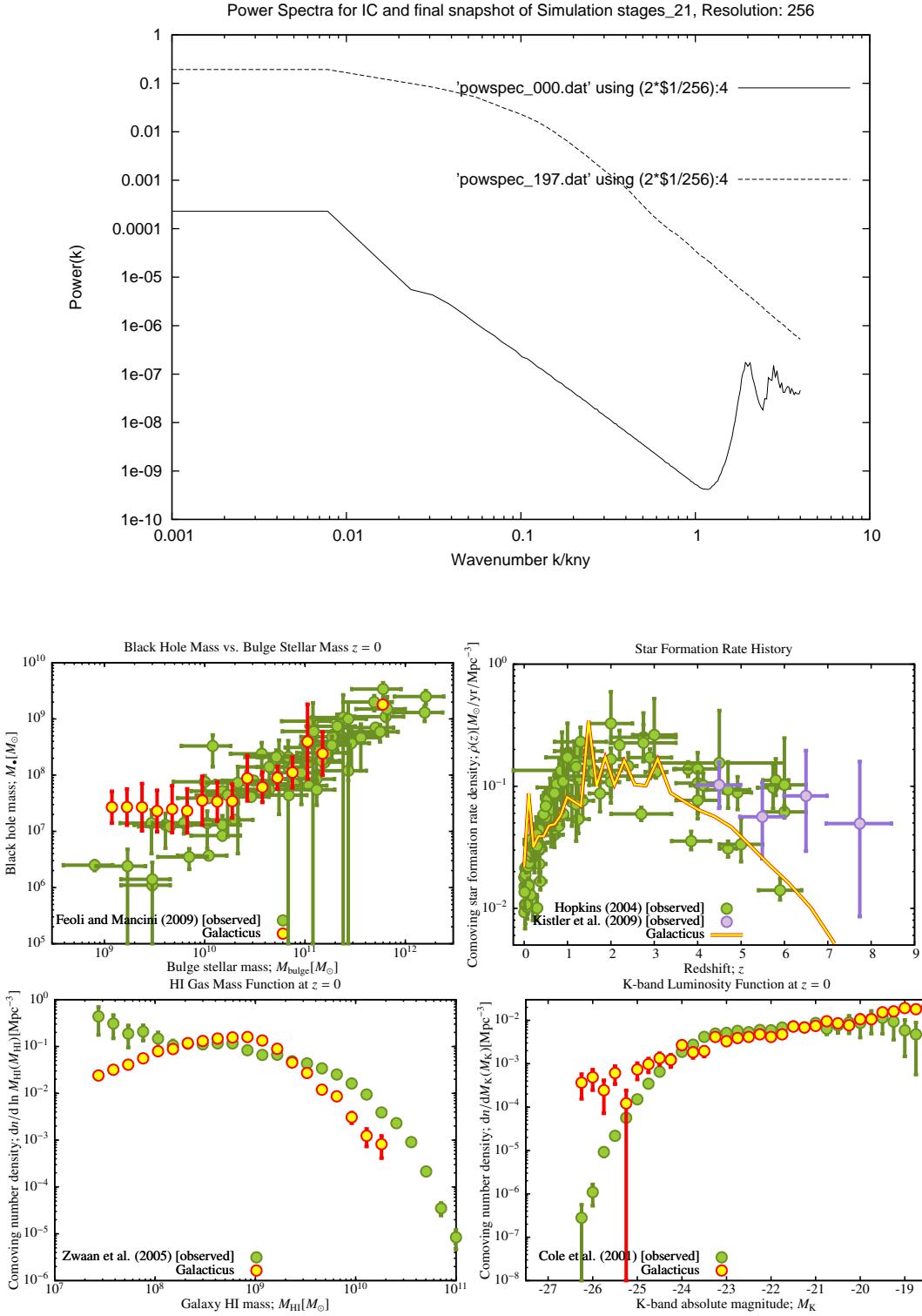
**stages\_20**

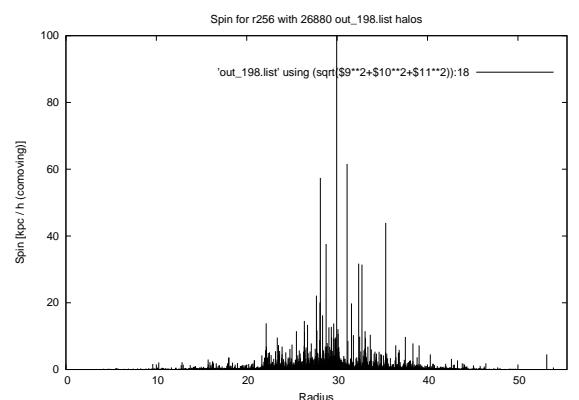
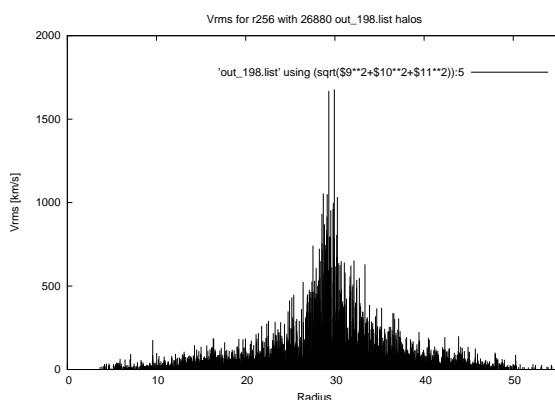
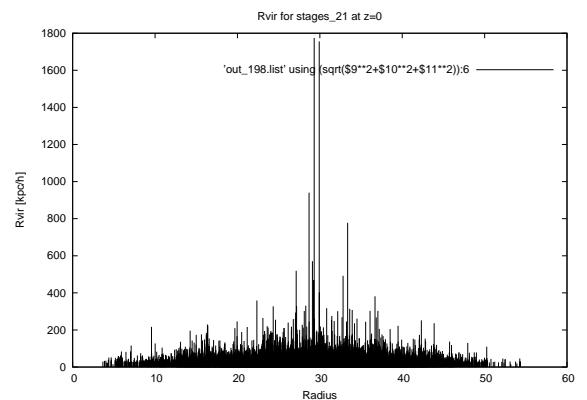
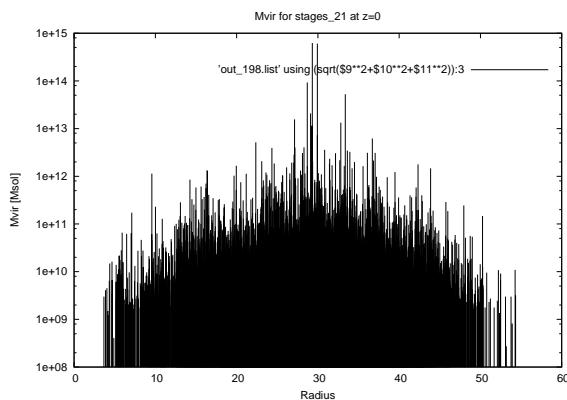
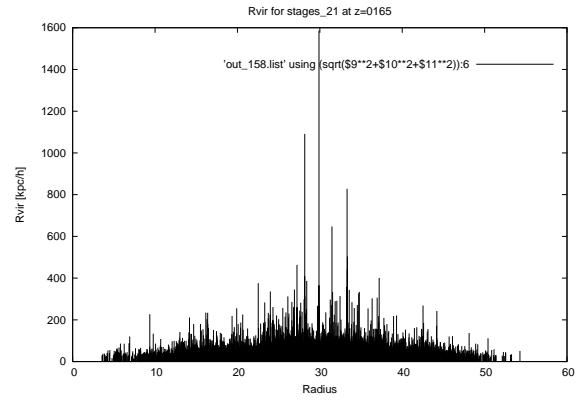
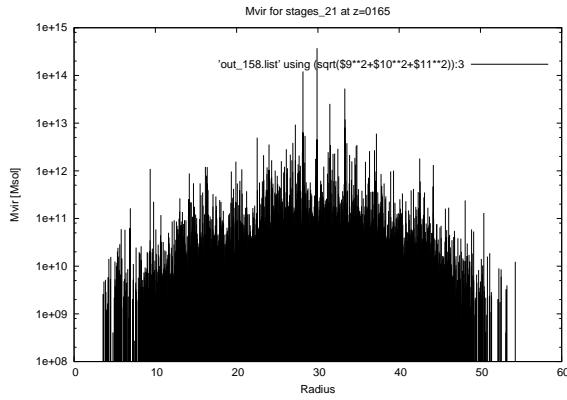
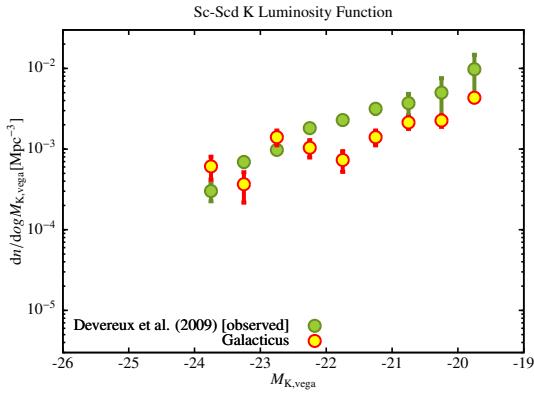




GALACTICUSSED ✓  
CONSISTENTTREED ✓  
ROCKSTARRED ✓

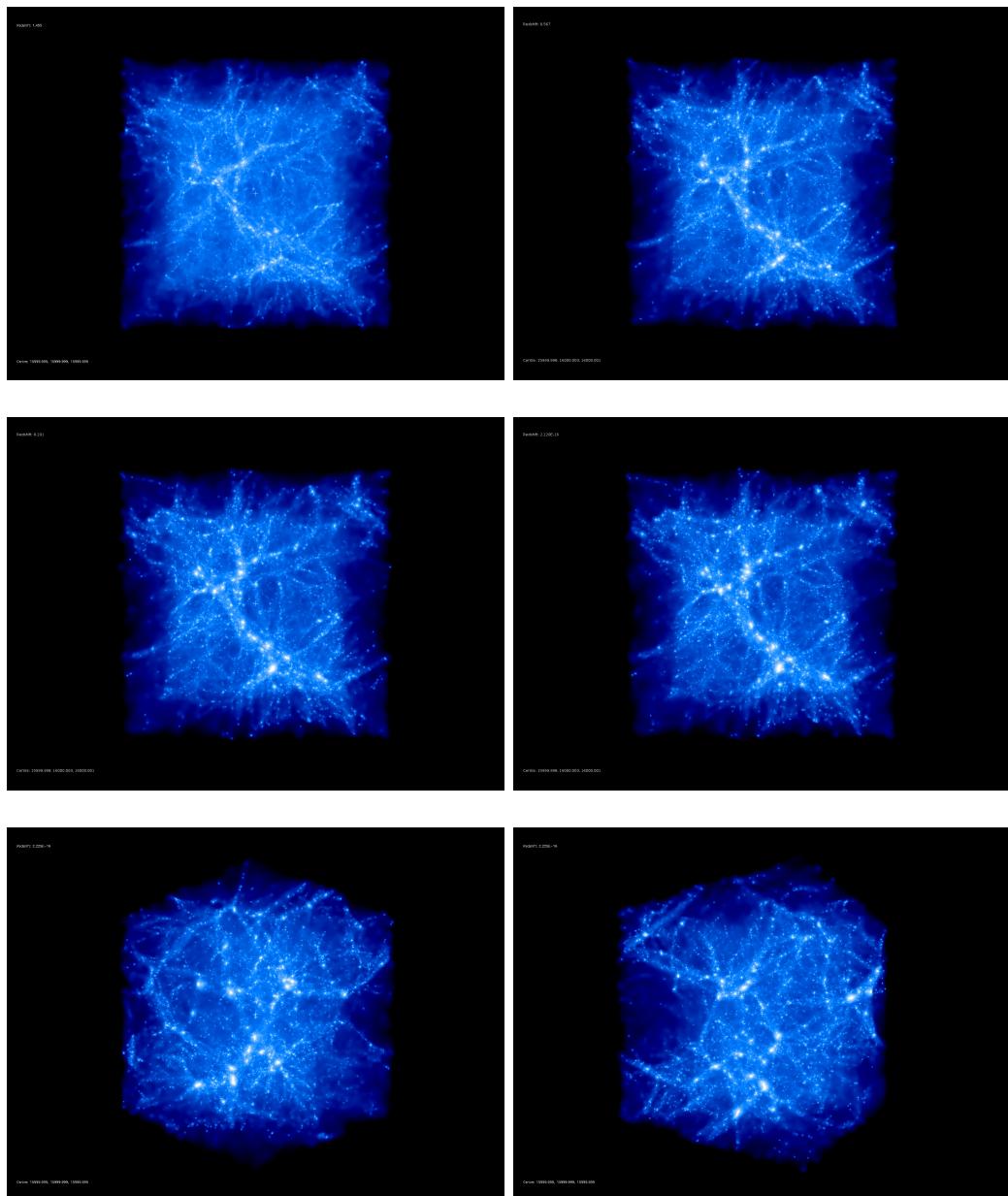
**stages\_21**

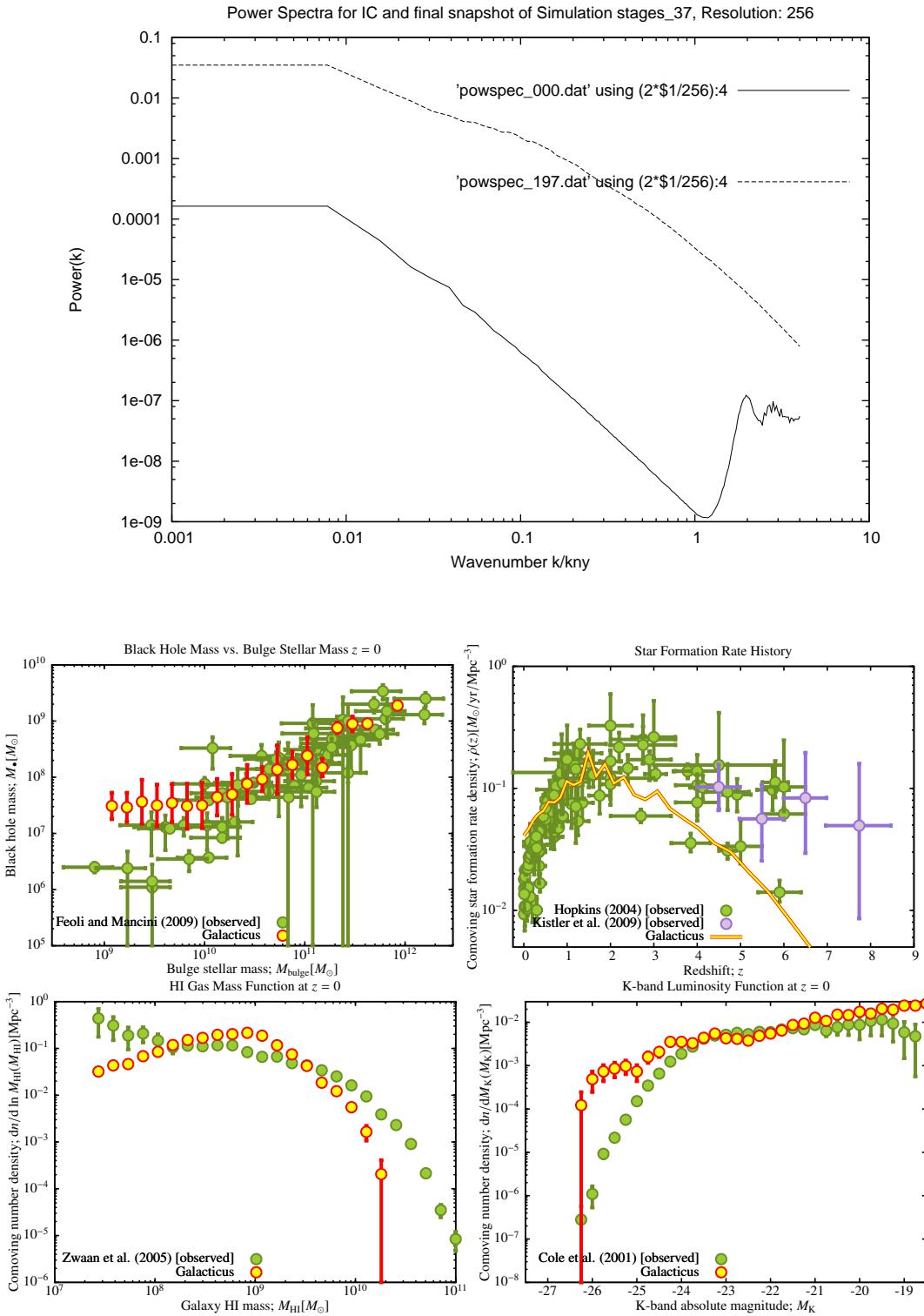


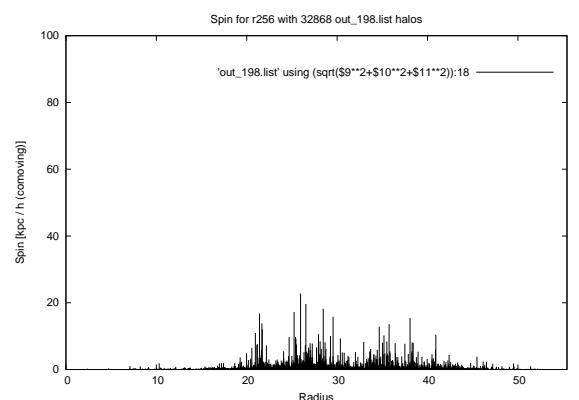
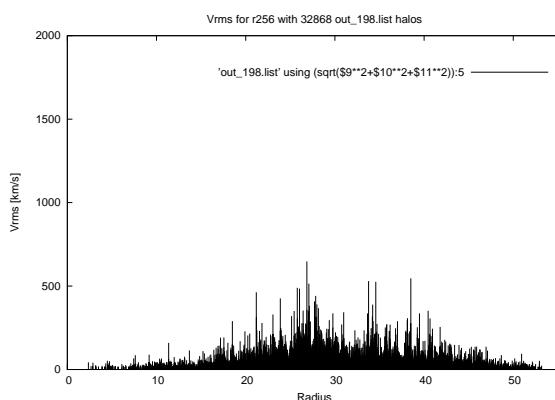
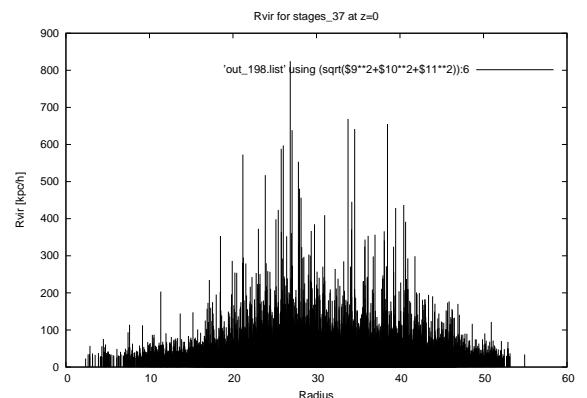
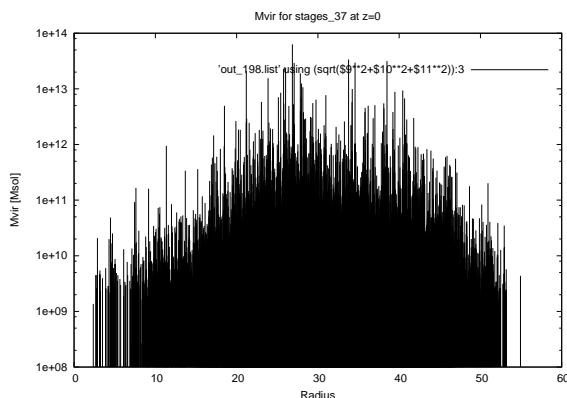
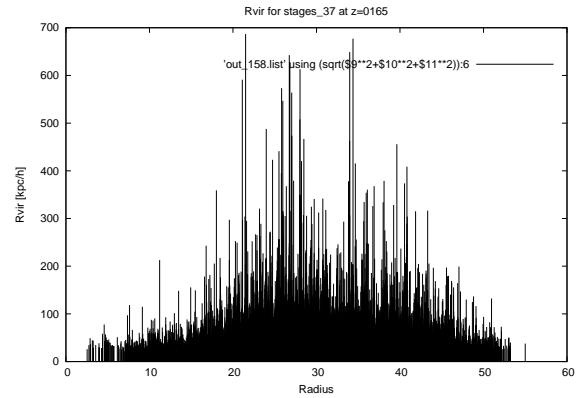
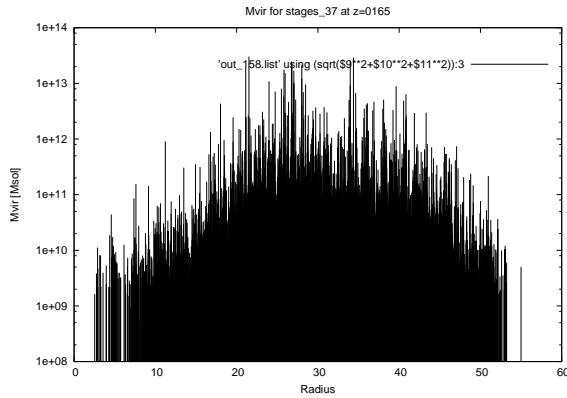
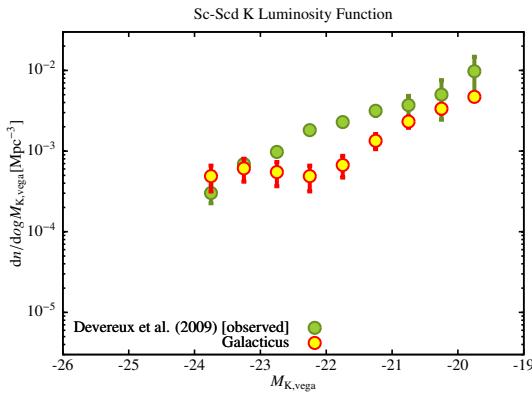


GALACTICUSSED ✓  
CONSISTENTTREED ✓  
ROCKSTARRED ✓

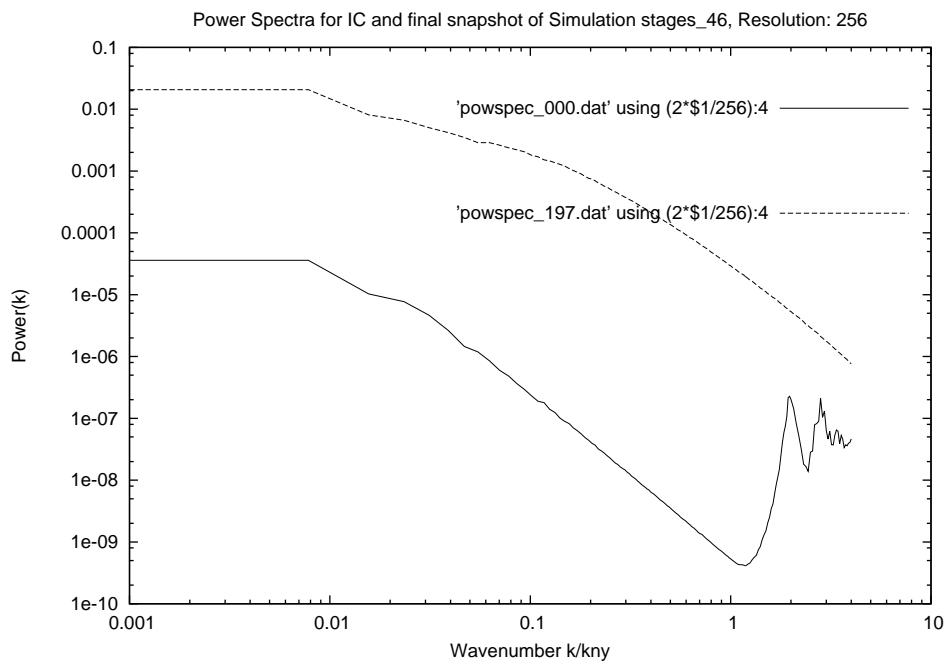
stages\_37



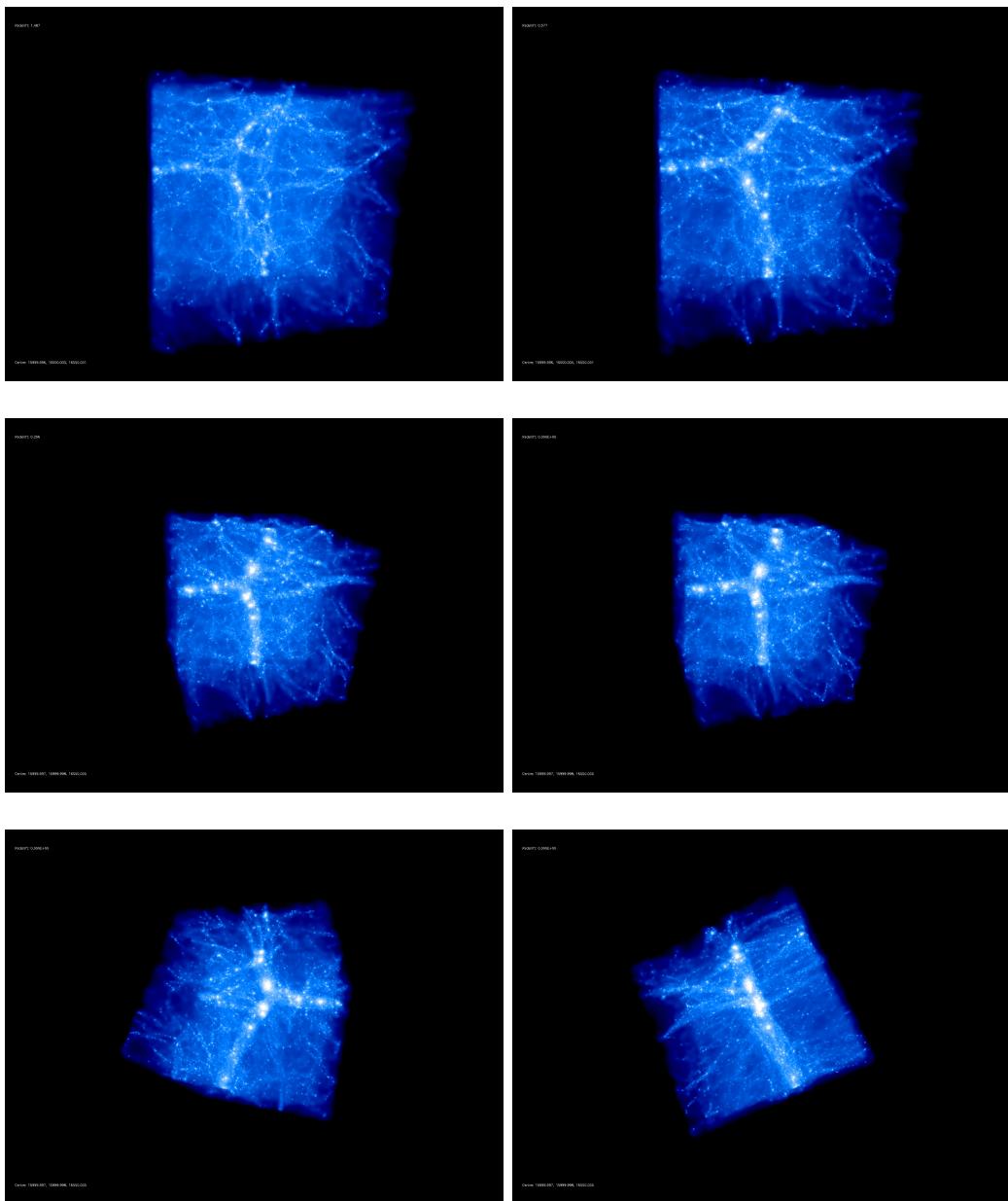


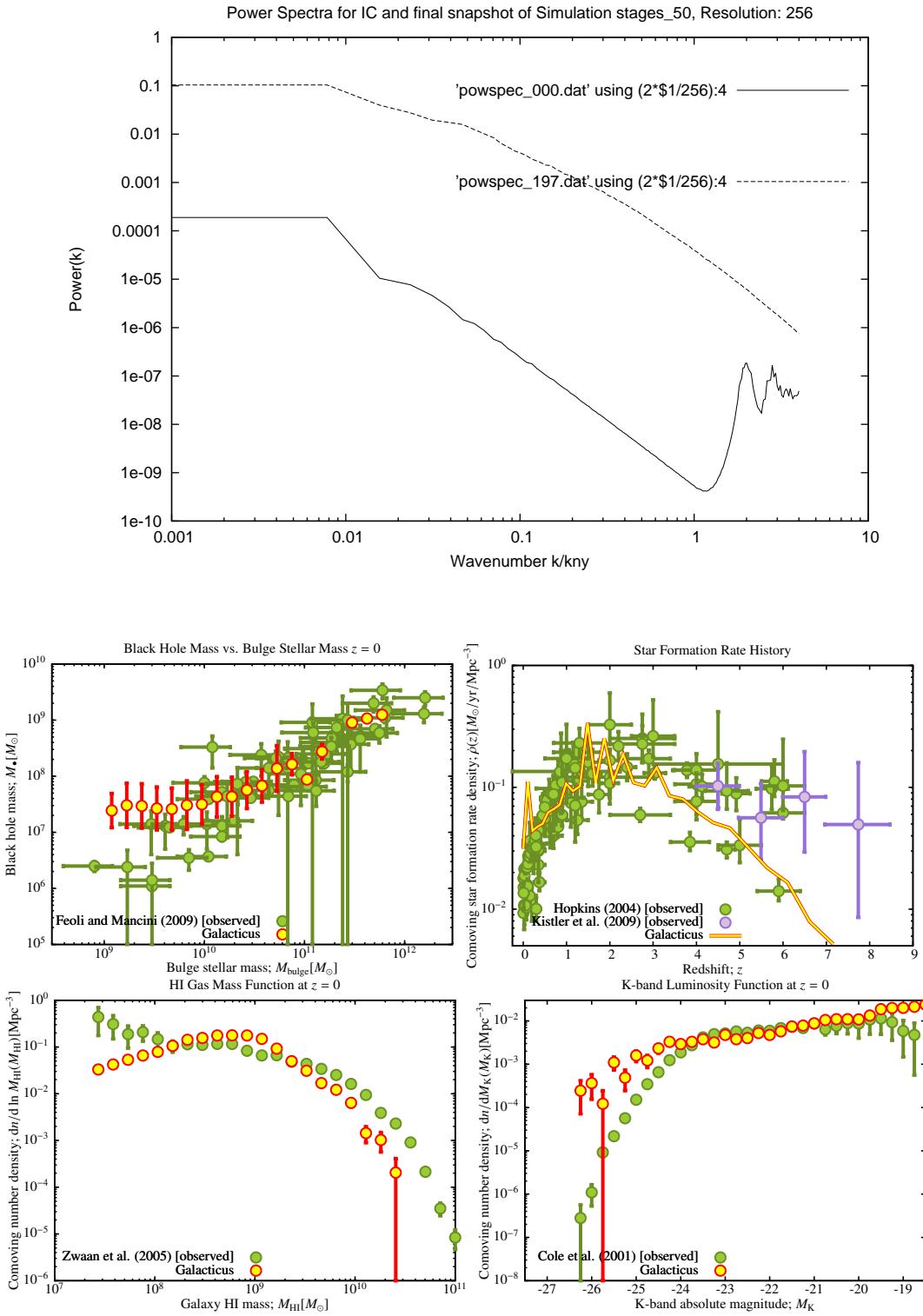


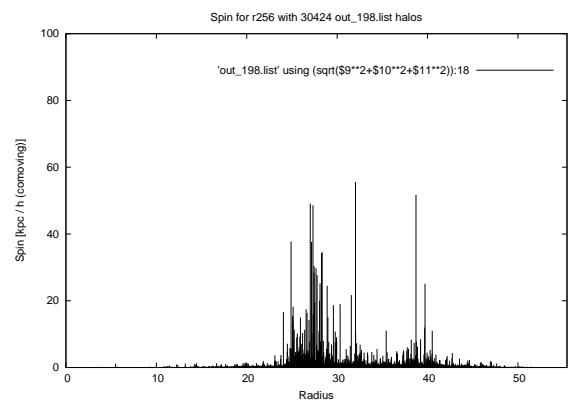
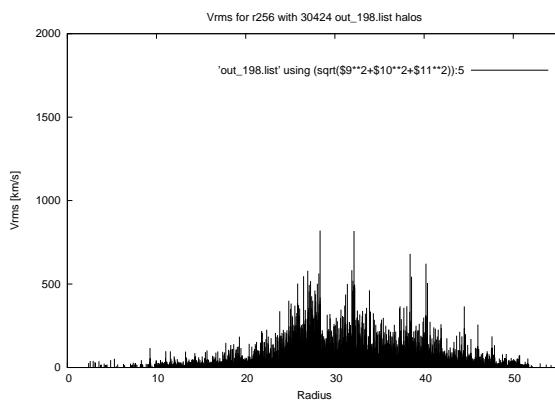
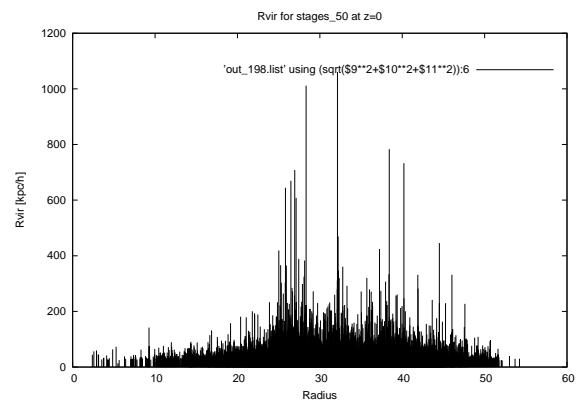
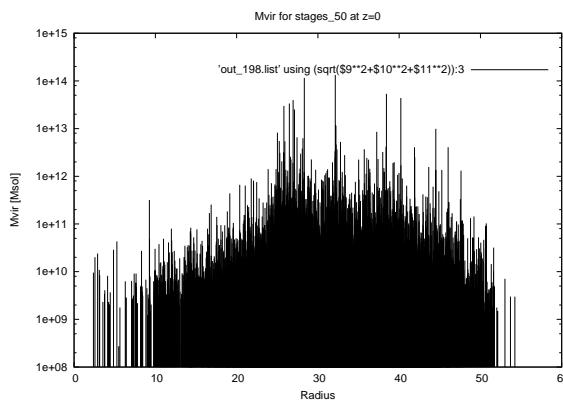
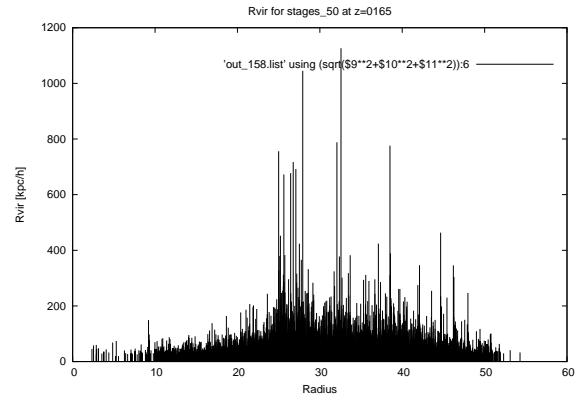
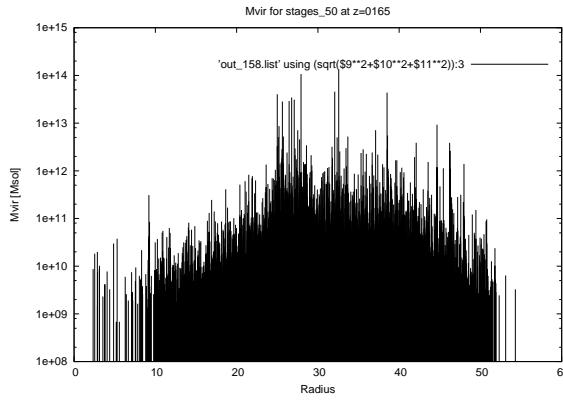
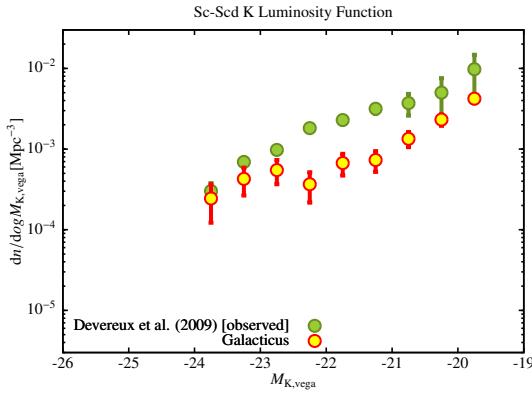
GALACTICUSSED ✓  
CONSISTENTTREED ✓  
ROCKSTARRED ✓

**stages\_46**

## stages\_50

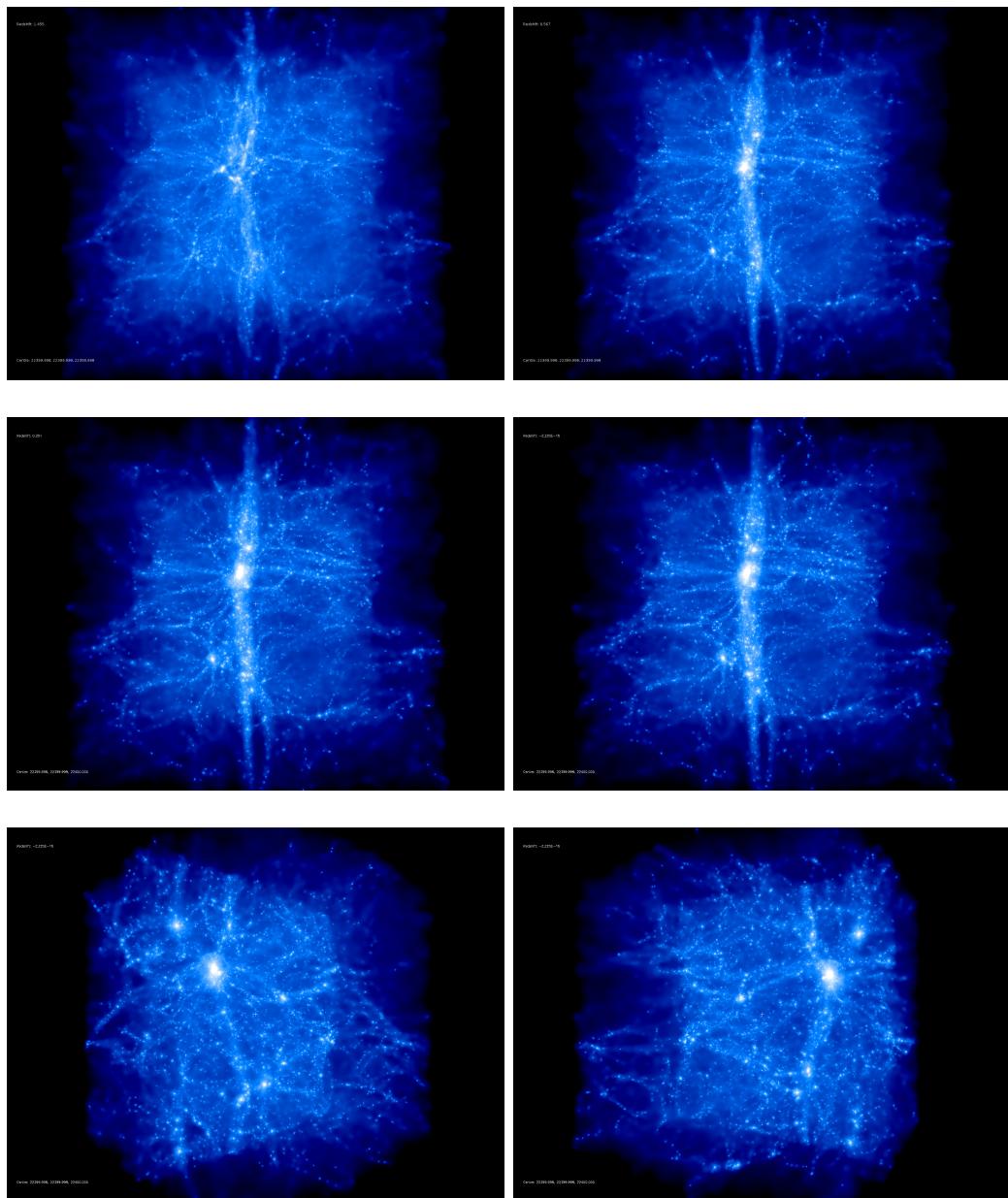


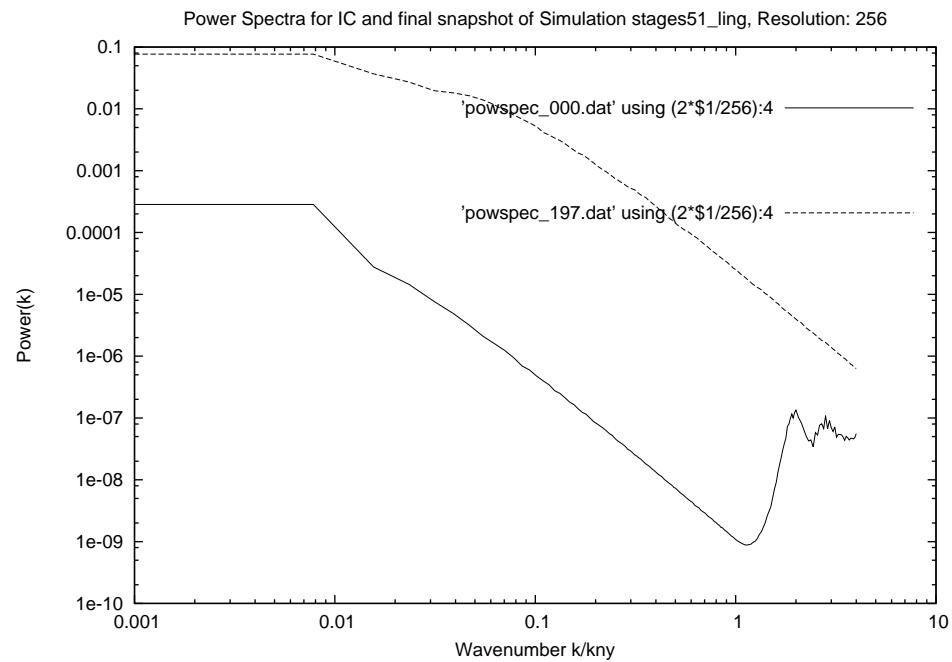




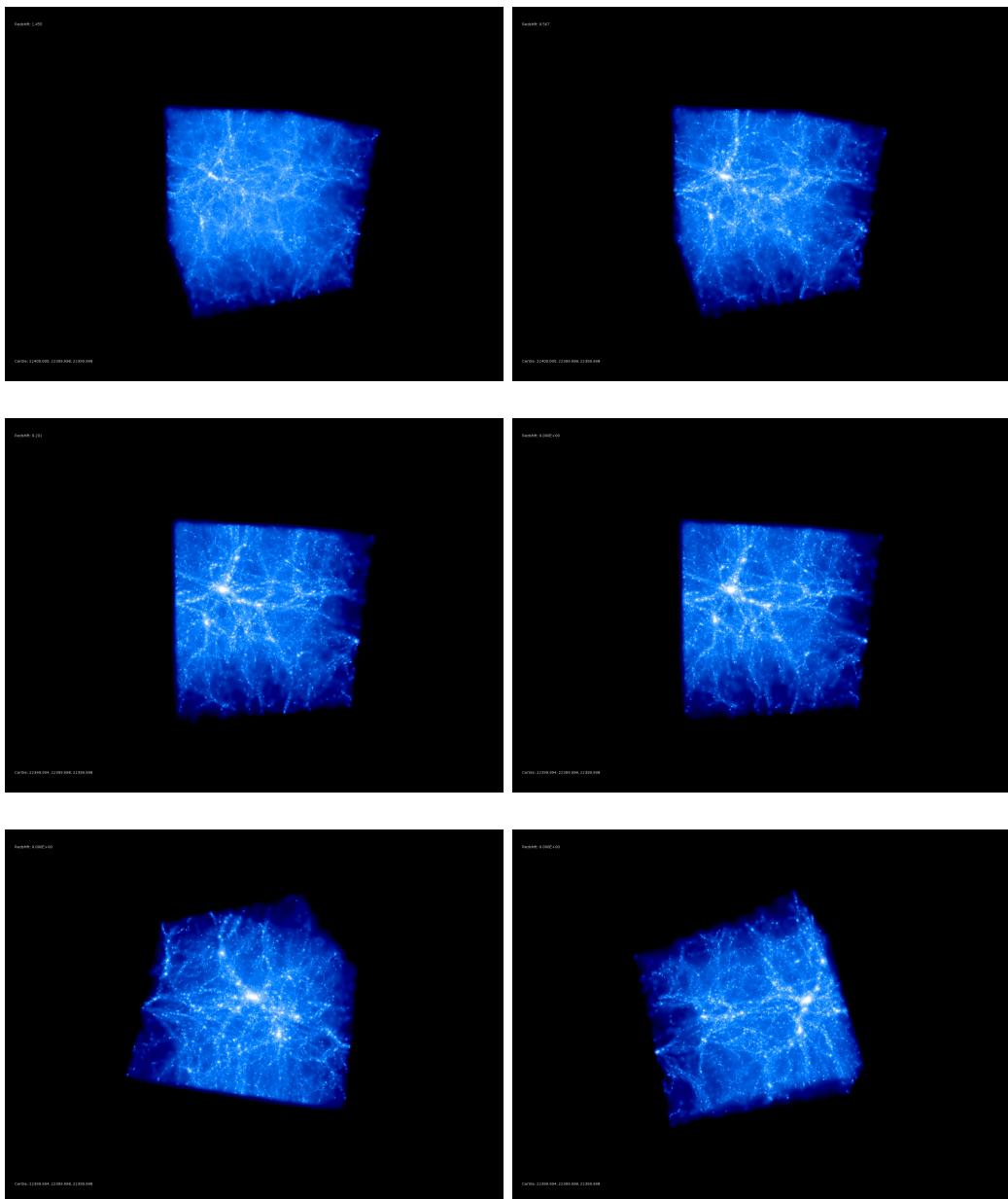
GALACTICUSSED ✓  
CONSISTENTTREED ✓  
ROCKSTARRED ✓

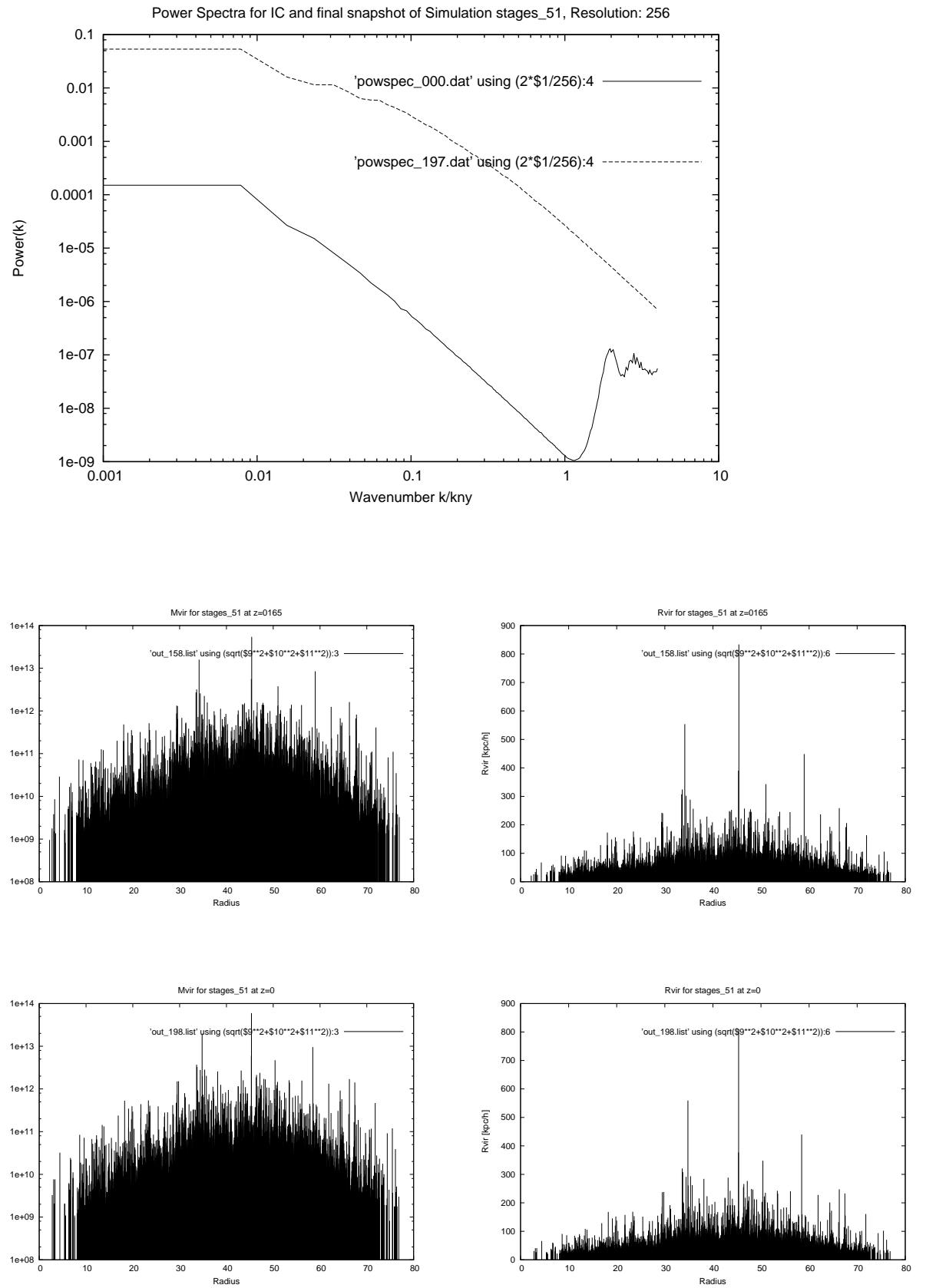
stages51\_ling

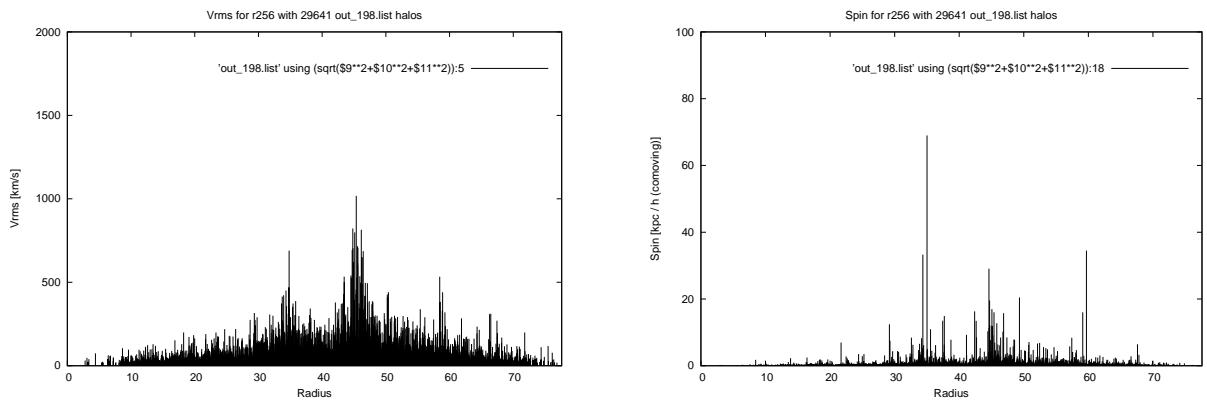




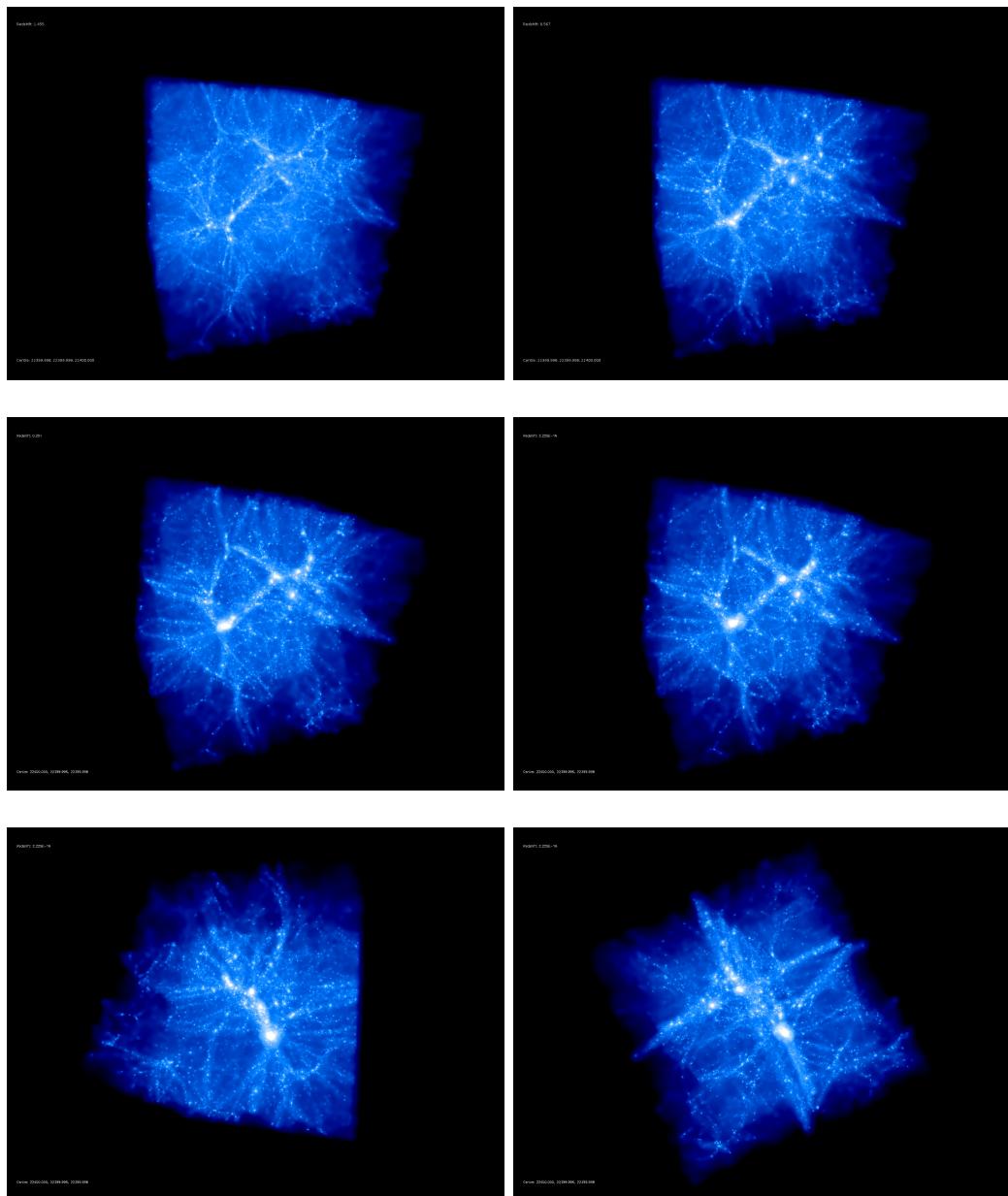
GALACTICUSSED ✓  
CONSISTENTTREE ✓  
ROCKSTARRED ✓

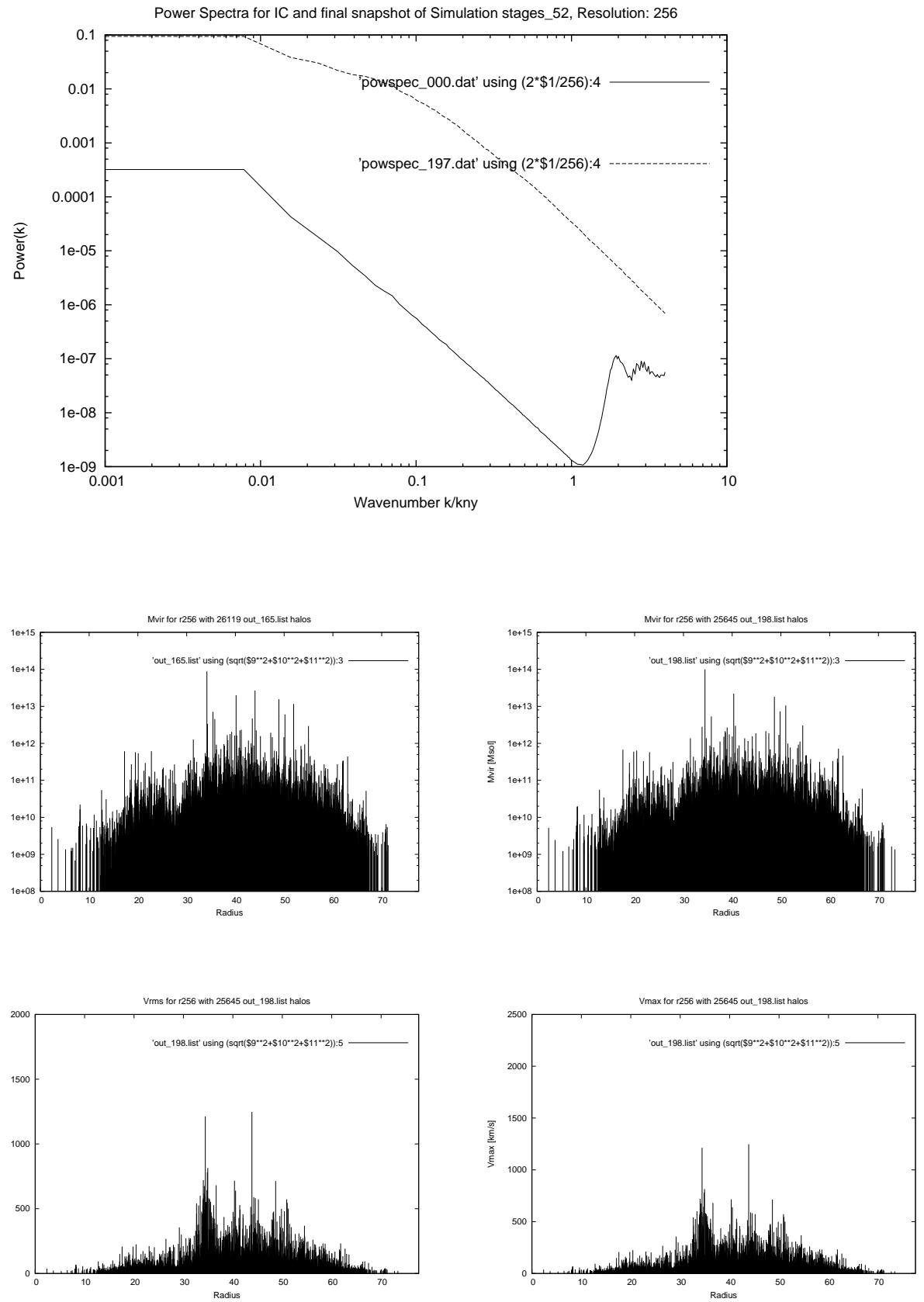
**stages\_51**

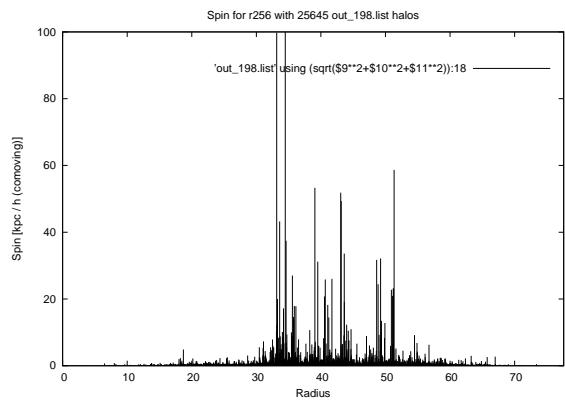




GALACTICUSSED ✓  
CONSISTENTTREEDE ✓  
ROCKSTARRED ✓

**stages\_52**





**stages\_54dr5d5**

**stages\_56**