The formation of the brightest cluster galaxies

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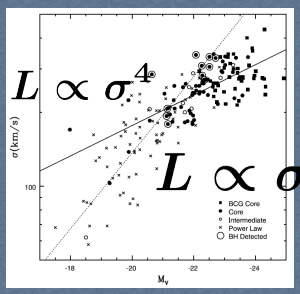
Introduction

Brightest Cluster Galaxies(BCGs) are

the most massive and luminous galaxies.

They are located in the very center of a cluster.

>>different formation history from typical galaxies



BCGs lie the steeper Faber & Jackson relation.

(Faber & Jackson 1976)

Method

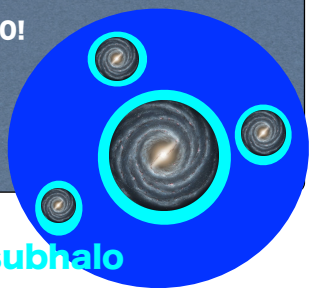
1: Run a high resolution cosmological simulation with dark matter only
N=512^3, L=30Mpc/h, Mp=1.5e7Msun/h

2: Identify the massive cluster at z=0

3: Trace the particles to z=3, and identify subhalos including the particles

4: Replace the sublahos with galaxies
galaxy --- halo+disk+bulge

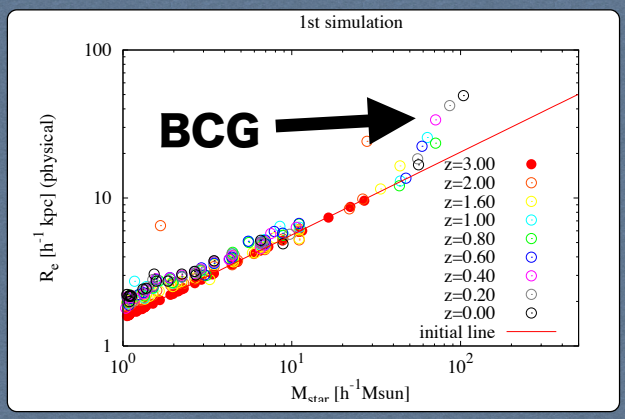
5: Re-simulate from z=3 to z=0!



Results

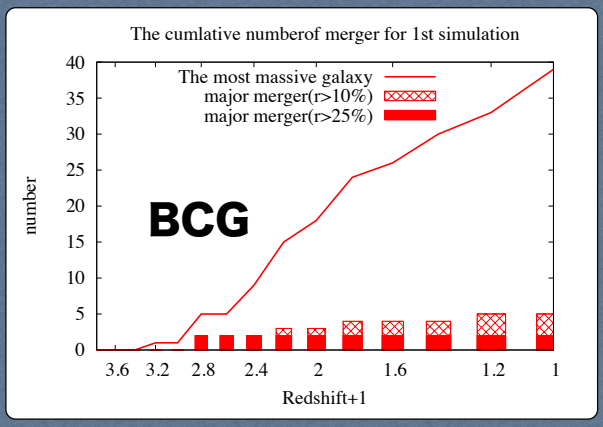
The case is that the cluster and BCG mass at z=0 are1.6e14Msun and 1.0e12Msun

This figure shows the relation between galaxy mass and half mass radius Re.

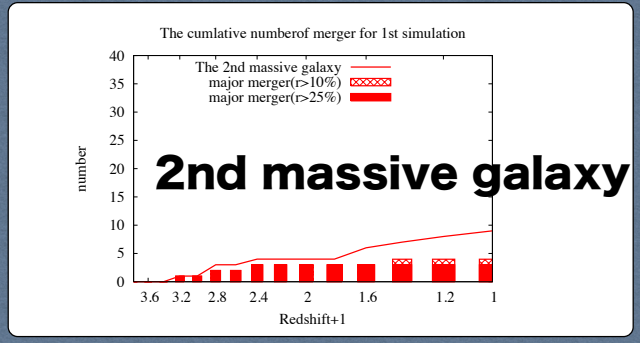


>>The relation of BCG between mass and size is different with other galaxies

Why does only BCG have the different relation???
I consider the number of merger to find out this



>>There are little major mergers, but many minor mergers



>>There are little major mergers, and little minor mergers

<<Summary>>

I did the cosmological simulation with dark matter+star.

As the results the BCG has the different size-mass relation from other galaxies.

The number of merger is calculated.
And I found out it is due to many minor mergers!