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.

(L = σ^4 vs L = σ^7)
(Faber & Jackson 1976)

Method

1: Run a high resolution cosmological simulation with dark matter only
N=512^3, L=30Mpc/h, M_p=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 subhalos 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 are 1.6e14Msun 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

--- <<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!