The formation of the brightest cluster galaxies

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Introduction

Method

1: Run a high resolution cosmological simulation **Brightest Cluster Galaxies(BCGs) are** with dark matter only N=512^3, L=30Mpc/h, Mp=1.5e7Msun/h the most massive and luminous galaxies. They are located in the very center of a cluster. 2: Identify the massive cluster at z=0 >>different formation history from typical galaxies 3: Trace the particles to z=3, and identify subhalos including the particles **BCGs lie the steeper** L 4: Replace the sublahos with galaxies \propto Faber & Jackson relation. galaxy --- halo+disk+bulge \mathbf{x} 5: Re-simulate from z=3 to z=0! clust (Faber & Jackson 1976) **Results** subhalo The case is that the cluster and BCG mass at z=0 are1.6e14Msun and 1.0e12Msun Why does only BCG have the different relation??? This figure shows the relation between I consider the number of merger to find out this galaxy mass and half mass radius Re. 1st simulation The cumlative number of merger for 1st simulation 100 40 The most massive galaxy major merger(r>10%) 35 major merger(r>25%) Re [h⁻¹ kpc] (physical) BCG 30 z=3.00 25 z=2.00number 10 z=1.60 20 BCG z=1.0015 z=0.80 \odot z=0.6010 z=0.40 z=0.20 z=0.00 0 5 initial line 1 0 10⁰ 10^{1} 10^{2} 3.6 3.2 2.8 2.4 2 1.6 12 $M_{star} [h^{-1}Msun]$ Redshift+1 >>The relation of BCG between mass and size >>There are little major mergers, but is different with other galaxie many minor mergers - <<Summary>> The cumlative number of merger for 1st simulation 40 The 2nd massive galaxy major merger(r>10%) xxxxx major merger(r>25%) 35 I did the cosmological simulation with 30 dark matter+star. 25 2nd massive galaxy 20 As the results the BCG has the different 15 size-mass relation from other galaxies. 10 The number of merger is calculated. 3.6 3.2 2.8 2.4 1.6 1.2 2 Redshift+1 And I found out it is due to many minor mergers! >>There are little major mergers, and little minor mergers