

The Formation and Evolution of Cosmological Structures at High Redshift ($Z > 8$)

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We have explored the formation and evolution of the cosmological structures using an unprecedented cosmological simulation with one billion dark matter particles in the standard Cold Dark Matter(SCDM) model. Applying the Oct-Sibling Tree to a newly devised halo-finding algorithm, halo candidates at various redshifts($28 < Z < 8$) are obtained with high speed and on more reliable physical basis than other halo-finding algorithms.

We have investigated the size, mass, shape and rotational properties of individual virialized halos, and multiplicity function of halos at each redshift comparing with the analytic Press-Schechter multiplicity function. Finally we mention the accretion and merging rate of halos, which phenomena come from the hierarchical evolution of cosmological structures.