

[GC11] **Environmental Dependence of Physical Quantities of the Mock and SDSS galaxies**

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We have investigated the dependence of physical quantities of mock and SDSS galaxies on the local environment. Luminosities are assigned to mock galaxies in the PSB halos based on the one-to-one correspondence monotonic model, and a local density of a galaxy is measured by an adaptive spline kernel to quantify the local environment. We have studied the environmental effect on luminosity functions and spin distributions of mock galaxies. For comparison, the same investigations are applied to the SDSS galaxy samples which are, as a result, found to have the same characteristics of luminosity and spin distributions of mock samples.

[GC12] **Topology Analysis of Luminous Red Galaxies
in the Sloan Digital Sky Survey**

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We have studied the topology of volume-limited galaxy samples selected from the very luminous red galaxies (LRG) in the Sloan Digital Sky Survey. LRGs are predominantly massive elliptical galaxies and tend to reside in massive dark matter halos. We compared the observed genus statistics with predictions for a Gaussian random field and mock LRG surveys constructed from dark matter halos in a Lambda CDM model. The mock surveys are made in the past light cone space to reach the depth of the LRG sample of 1200 Mpc/h. We have detected that the underdensity region in the LRG distribution shows a significant deviation from the Gaussian expectation. It shows that the topology of underdense region is sensitive to the non-linear processes and bias involved with galaxy formation.