

**[구GC-01] Precise measurements of distance using large scale structure formation**

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We introduce new methods to measure distance in precision using large scale structure formation. The accuracy to determine geometrical factors is enhanced in comparison to the previous method known as BAO. We determine both  $D_A$  and  $H$  simultaneously as well as structure of growth of density fluctuations and peculiar velocities. Our method is independent of any given prior on large scale structure formation such as the shape of spectra.

**[구GC-02] Luminous Red Galaxy Clustering Topology of the final SDSS data**

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We have studied the topology of volume-limited galaxy sample selected from the very luminous red galaxies (LRGs) in the completed 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 from perturbation theory and mock LRG surveys constructed from dark matter halos in a Lambda CDM model. To compare with the observational data, we made 129 mock surveys in the past light cone space by using three different size CDM simulations: 41203 particle 6592 Mpc/h, 60003 particle 7200 Mpc/h, and 7210<sup>3</sup> particle 10815 Mpc/h.