[S09-1] Topology Analysis of the Sloan Digital Sky Survey: I. Scale and Luminosity Dependence

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The Sloan Digital Sky Survey (SDSS) data has now become large enough to allow us to study the three dimensional topology of the galaxy distribution and its dependence on physical properties of galaxies. We have used a large scale structure data, Sample 14 of the New York Value-Added Galaxy Catalog and studied the dependence of topology of large scale structure on smoothing scale and galaxy luminosity. From the catalog several volume-limited samples and subsamples are made. We have accurately measured the genus statistic and its related parameters measuring deviations of the genus curve from the Guassian one by making extensive usage of mock surveys generated from a new large volume N-body simulation.
We have found a strong evidence for biased galaxy formation in low density environments and have detected luminosity bias of topology through the shift parameter, $\Delta\nu$, in the sense that distribution of brighter galaxies is more negatively (meatball) shifted than that of faint ones. The galaxy biasing mechanism should not only make brighter galaxies hard to form in under-dense environments and cluster more strongly, but also make distributions of bright and faint galaxies have meatball and bubble shifts, respectively. Scale dependence of the luminosity bias is not detected.

[S09-2] Progress Report of Identifying Ultraluminous Infrared Galaxies of IRAS Sources in the Sloan Digital Sky Survey, 2dF and 6dF Galaxies

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We present a progress report of cross-correlation of Infrared Astronomical Satellite (IRAS) sources with Sloan Digital Sky Survey(SDSS), 2dF and 6dF galaxies. IRAS Faint Sources Catalog (FSC) and Improved Reprocessing of the IRAS Survey(IRIS) Faint Sources Catalog which is a compilation of the sources extracted from the new generation of IRAS images(Miville-Deschenes & Lagache 2004) are uesd as IRAS sources. Using the infrared flux from IRAS sources and the redshifts from SDSS, 2dF and 6dF, we have identified UltraLuminous Infrared Galaxies(ULIGs) candidates and HyperLuminous Infrared Galaxies(HyLIGs) candidates. The luminosity function and luminosity evolution of ULIGs and HyLIGs is discussed. The comparison between ULIGs and HyLIGs in cluster of galaxies and in field is shown.