[GC05] Void statistics in numerical simulation

박대성, 이정훈
서울대학교

Cosmic voids are the regions of the universe containing few or no galaxies, that is, the most under-dense regions of the universe. We detect galaxy voids in the Millennium simulation data using the void-finding algorithm of Hoyle and Vogeley (2002). In order to understand the nature of voids, we investigate multiplicity, mass, volume, shape distributions and density profile and examine void spins and their correlation properties.
From our results, it is hard to escape the conclusion that voids have a rotational motion. In this talk, the detailed void finding method, our analytic model for the spin angular momentum of voids originated from the tidal shear effect, and its test against the Millennium data will be presented. We expect this work shed light on the understanding of the origin and properties of the cosmic voids and the large scale structure of the universe.

[GC06] Velocity profiles of galaxies from the optical radius to the virial radius

Kyu-Hyun Chae(채규현)
Sejong University & ARCSEC" (세종대학교 & 우주구조와 진화 연구센터)

We derive velocity profiles of early-type galaxies from the effective radius and the virial radius from the combined analysis of strong lensing and semi-analytical modeling of galaxy formation. Stong lensing constrains the velocity dispersion (or the circular velocity) at the effective radius while semi-analytical models of galaxy formation predict the virial circular velocity. We find that velocity profiles of galaxies vary systematically as the mass of the galaxy varies. For a galaxy of velocity dispersion 200 km/s, the ratio of the optical circular velocity to the virial circular velocity is about 1.65 but decreases to 0.65 for velocity dispersion 260 km/s. The scaling between the optical velocity dispersion (σ) and the virial circular velocity (v_c) is given by $\sigma \propto v_c^{0.22}$. These results imply that smaller haloes are much more significantly affected by the baryonic condensation in the inner region of the haloes in agreement with theoretical predictions.