[구GC-15] Morphology Conformity in Galactic Satellite Systems

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We have studied the morphology of galaxies in the galactic satellite systems. We searched for satellite systems in a volume-limited sample of galaxies brighter than $M_r = -18.0$ with a redshift range of $z < 0.02 < 0.04724$ from the SDSS DR5 sample. We applied several sets of satellite selection criteria including isolation criteria for host galaxies since there is no single way to define the galactic satellite systems. The morphology of satellites is determined by an automated morphology classifier, but the host morphologies are visually confirmed. We found segregation of satellite morphology according to the projected distance from the host galaxy. The amplitude and shape of the early-type satellite fraction profile are found to depend on the host luminosity. This is the morphology-radius/density relation at the galactic scale. There is a strong tendency for morphology conformity between the host galaxy and its satellites. The early type fraction of satellites hosted by early type galaxies is systematically larger than that of late type hosts, and is a strong function of the distance from the host galaxies. Dependence of satellite morphology on the large-scale background density was detected. The fraction of early type satellites increases in high density regions for both early and late type hosts. It is argued that the conformity in morphology of galactic satellite system is mainly originated by the hydrodynamical and radiative interactions between hosts and satellites. Our conclusions are quite robust since they do not depend on the selection criteria of satellite systems.

[구GC-16] The evolutions of the velocity dispersion functions of galaxies

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We use Monte Carlo methods to derive the local velocity dispersion functions of galaxies per morphological type and for the total galaxy population based on the SDSS galaxy counts and the SDSS intrinsic correlations between luminosity and internal velocity. We then use galactic-scale strong lensing statistics to derive the evolutions of the velocity dispersion functions for the first time. The data clearly favor the evolution of the shape as well as the number density. In particular, the data suggest that the most massive part of early-type galaxies evolves least from $z=1$ to $z=0$ while less massive galaxies evolve significantly, supporting "mass downsizing" scenario in galaxy formation/evolution. The results are compared with other recent results on galaxy evolutions and theoretical predictions.