[구GC-17] The Bridge Effect of Void Filaments

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Cosmic filaments play a role of bridges along which matter and gas accrete onto galaxies to trigger star formation and feed central black holes. Here we explore the correlations between the intrinsic properties of void galaxies and the linearity R_L of void filaments (degree of filament's straightness). We focus on void regions since the bridge effect of filaments should be most conspicuous in the pristine underdense regions like voids. Analyzing the Millennium-Run semi-analytic galaxy catalogue, we identify void filaments consisting of more than four galaxies (three edges) and calculate the means of central black hole mass, star formation rate, and stellar mass as a function of R_L. It is shown that the void galaxies constituting more straight filaments tend to have higher luminosity, more massive central black holes and higher star formation rate. Among the three properties, the central black hole mass is most strongly correlated with R_L. It is also shown that the dark halos constituting straight filaments tend to have similar masses. Our results suggest that the fuel-supply for central black holes and star formation of void galaxies occurs most efficiently along straight void filaments whose potential wells are generated by similar-mass dark halos.

[구GC-18] Relation of mean stellar ages of galaxies and cluster mass

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We have been carrying out a project to investigate the dependence of galaxy population on cluster properties using cluster galaxy sample selected from the Sloan Digital Sky Survey. We present preliminary results focusing on mean stellar ages of galaxies and cluster velocity dispersions strongly correlated with cluster mass. We estimate the stellar ages with whole spectrum fitting method (STECKMAP; Ocvirk et al. 2006). We find that the ages of faint late-type galaxies in massive clusters are younger than those in less-massive clusters. This may be due to massive clusters including interacting subsystems. We also find that the ages of oldest galaxies are marginally correlated with cluster mass. This implies that galaxy formation in massive cluster begins at early epoch.