[구GC-12] Interactions between early- and late-type galaxies and morphology transformation

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We perform a set of N-body/SPH simulations of galaxy interactions between early- and late-type galaxies with the mass ratio of 2 to 1. We show that mass transfer during a flyby interaction (the closest approach distance ~50kpc) can cause the morphology transformation of an early-type galaxy to a late type. In our simulations, we vary the orbital parameters of the interactions and the cold gas fraction of the late-type galaxy to compare how the morphology transformation is affected by the amount of mass transfer and orbital angular momentum of cold gas accreted to the early type. We also include hot halo gas in the galaxy models and show the location of the tidal bridge can be influenced by the shock generated during the collision.

[구GC-13] On the origin of tidal features in cluster galaxies

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Although galaxy mergers are thought to play an important role in forming elliptical galaxies, mergers in galaxy clusters have drawn less attention compared to mergers in field environments because galaxies with high peculiar velocities are unlikely to merge with each other. However, comparable fractions of merger features in cluster galaxies have been reported from deep imaging of Abell clusters, suggesting the relevance of mergers in the transformation of cluster early-type galaxies (Sheen et al. 2012). As a more direct approach to understanding the origin of tidal features in clusters, we perform hydrodynamic re-simulations on a cluster of galaxies. Based on mock observation images of the simulated cluster galaxies, we construct and analyze the cluster early-type galaxy sample in a consistent manner with Sheen et al. 2012. We find that the fraction of tidal feature from the simulated cluster is comparable to that of the observation. Evolutionary history of the galaxies with merger features shows that most of the mergers responsible for the merger features in the present originate from outside the cluster more than 2Gyrs ago. We also find that many of the galaxies with tidal features show correlations with subgroups in the cluster. All these results suggest that merger features in the cluster are due to preprocessing before accretion into the cluster.