

TRACING GALAXY EVOLUTION IN LOW DENSITY ENVIRONMENT

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It is well known from the observations that in the high galaxy density environments (e.g., clusters), morphological, gaseous, and other properties of galaxies are distinctly different from galaxies in the isolated regions. We show here based on recent observations with various radio telescopes (VLA, Parkes etc.) including the GMRT that significant evolution of galaxies can take place in a low density environment typical of a group. As a part of the Ph.D. thesis, I studied a nearby (~ 23 Mpc) group of galaxies 'Eridanus' in the HI 21cm-line and radio continuum. A total of 46 galaxies of different morphological types were observed using more than 200 hours of GMRT observations. The Eridanus galaxies are found to be HI deficient up to a factor of 2-3 compared to their counterparts in the isolated environment. These are new and unexpected results for a loose group of galaxies. The galaxies in this group often show peculiar or disturbed HI morphologies in the form of warps, HI plumes and tidal tails. The velocity fields of galaxies also show measurable amount of kinematical lopsidedness. It is suggested that the HI deficiency is due to tidal interactions. Based on the physical conditions in the group, we rule out most of other galaxy evolution processes, e.g., ram-pressure stripping, transport processes etc. The Eridanus group appears to be undergoing an early phase of cluster formation. These results have important implications for theories of galaxy evolution.