

Spatial segregation and star formation in dwarf spheroidal galaxies: Local Group and beyond

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Nearby dwarf galaxies is an excellent laboratory to study the processes of star formation in details, since the galaxies are resolved into individual stars, and their structure is relatively simple. Last years, we have discovered and studied a number of isolated nearby dwarf spheroidal galaxies. It is important to get detailed consideration to these rare objects, since the common recent scenario of dSphs formation suggests that such galaxies are formed due to the interaction between a rotationally supported dwarf irregular galaxy and a MW-sized host galaxy. Then rather isolated dwarfs should be exceptionally irregular, and the discovered objects should follow an other scenario of the formation and evolution. Using our HST/ACS observations of these objects, we homogeneously measured their star formation histories (SFHs). All objects demonstrate a complex SFH, with a significant portion of stars formed 10-13 Gyr ago. Nevertheless, the stars of middle ages (1-8 Gyr) are presented. In order to understand how the SF parameters influence the evolution of the dSphs, we also studied a sample of nearest dSphs in a different environment: isolated ($d < 2$ Mpc); beyond the Local Group (LG) virial radius (but within the LG zero velocity sphere); the satellites of M31 located within the virial zone (300 kpc). We also significantly expanded our sample with 13 dwarf spheroidal galaxies of the nearby Centaurus A group. Using our and archival HST/ACS observations of the dSphs, we measured their SFHs. A comparative analysis of the parameters obtained give us a possibility to distinguish a possible effect of the spatial segregation on the dSphs evolution scenario.