X51a Estimating the total mass and onset timing of galactic winds in dwarf galaxies using Galactic Archaeology

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The Local Group is a group of galaxies including the Milky Way. Most of the members are dwarf galaxies. Dwarf galaxies are considered to have evolved through a number of internal mechanisms and external processes. For example, the former include star formation and galactic winds. The latter include tidal effects and the influence of star formation by nearby massive galaxies. Dwarf spheroidal galaxies (dSphs), which are the main target of this study, are a class of galaxies with the lowest luminosities completely devoid of interstellar gas. The lack of interstellar gas in dSphs are considered to be due to some or most of the interstellar gas having been blown away/out by galactic winds in the past. Galactic winds are phenomena in which gas is partially or entirely blown away/out of a galaxy when a large number of supernova explosions occur in a short period of time. In previous studies (e.g., Ferarra et al. 2000), the onset conditions for galactic winds have been attributed to the halo mass. Therefore, we estimated the halo mass using the observed data in this study. In addition, we calculated the onset timing of the galactic wind by considering the SNe energy and the binding energy, then compared it with the star formation history (SFH). The results show that galactic winds have blown away/out in many dwarf galaxies, and that star formation has temporarily or almost completely stopped. However, there were some dwarf galaxies for which no galactic wind was supposed to have blown, depending on the assumed conditions. We plan to discuss those results and also how to estimate the SFH.