*The General Assembly of Galaxy Halos: Structure, Origin and Evolution*
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# Study of the Milky Way's hot coronal gas with its dwarf galaxies

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**Abstract.** A large amount ($5\times10^{10}$ M$_\odot$) of hot gas is thought to exist in an extended ($\approx 200kpc$) hot diffuse halo around the Milky Way. We investigate the competitive role of the different dissipative phenomena acting on the onset of star formation of this gravitationally bound systems in this external environment. Ram pressure, Kelvin-Helmholtz and Rayleigh- Taylor instabilities, and tidal forces are accounted for separately in an analytical framework and compared in their role in influencing the star forming regions. We present an analytical criterion to elucidate the dependence of star formation in a spherical stellar system on its surrounding environment, useful in observational applications as well as theoretical interpretations of numerical results. We consider the different signatures of these phenomena in synthetically realized colour-magnitude diagrams (CMDs) of the orbiting system, thus investigating the detectability limits and relevance of these different effects for future observational projects. The theoretical framework developed has direct applications to the cases of our MW system as well as dwarf galaxies in galaxy clusters or any primordial gas-rich star cluster of stars orbiting within its host galaxy.

**Keywords.** Galaxy: halo, Galaxy: fundamental parameters, galaxies: dwarf

## 1. Milky Way galactic halo model

We model a time-dependent Milky-Way-like galaxy considered as a gravitational environment in which to study the orbital evolution of a dwarf galaxy. A mass growth rate is applied only to the halo component of the Milky Way (MW) while all the other MW components are kept constant with a parameter distribution as in Pasetto *et al.* 2011, 2012a,b. We examine whether different profiles of hot intergalactic medium (HIGM) surrounding the MW halo can leave different observable traces on star formation of the orbiting dwarf galaxy and hence on its CMDs. For this purpose we simulate the evolution of a generic dwarf galaxy close to the MW with different HIGM distribution.

## 2. Results

The star formation history of the orbiting galaxy is reconstructed in Fig.1 by the methods presented in Pasetto *et al.* 2012a and Fujita (1998) for different HIGMs profiles. We found that the different HIGMs are able to influence the evolution of the molecular cloud distribution considered in the orbiting dwarf galaxy and leave different signatures on the CMDs (synthetically realized with the technique in Bertelli *et al.* 2009). This is

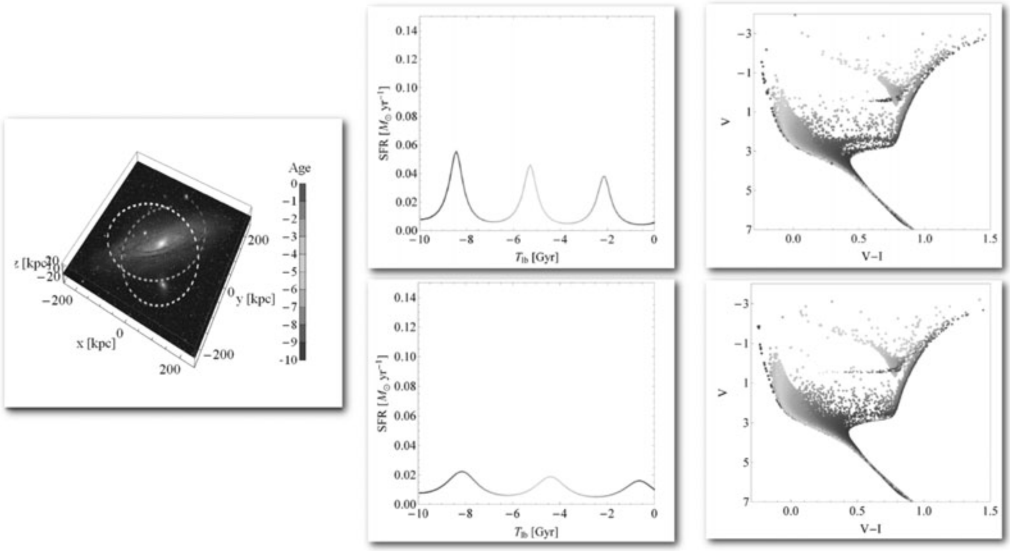


**Figure 1.** On the same orbit (left plot) the different electron density distributions are considered in calculating the star formation rate (central panels) and the synthetic CMDs (right panels).

more evident at the level of the sub-giant branch stars. We aim to realize a methodology able to compare automatically results with observations at least for the Local Group case and able to disentangle the different contributions to the star formation history of satellites in the Local Groups (e.g., Grebel, Gallagher, & Harbeck, 2003) thus placing a constraints on the orbits directly from the CMDs.

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