ENVIRONMENTAL EFFECTS

The Molecular Gas in Spiral Galaxies

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We have started a survey of the molecular gas content of spiral galaxies in high and low density regions (HDS and CS), selected according to well–defined criteria (Maia et al. 1994, *ApJS*, **93**, 425). The HDS sample is formed by galaxies that are in groups of three or more members. The groups are defined such that they have a density contrast $\delta\rho/\rho \geq 500$. This is equivalent to densities larger than 18 galaxies/Mpc^3. The CS sample is made up of galaxies which are not members of any group and which are situated in a region with a density contrast $\delta\rho/\rho \leq 0.01$, i.e. less than 0.0004 galaxies/Mpc^3.

We have detected CO emission in all 35 galaxies observed with the SEST radiotelescope on La Silla; 19 from the HDS and 16 from the CS. Although galaxies in the CS on average are more luminous than those in the HDS (a possible distance bias in our small subsample), the blue luminosity surface density of the two samples are indistinguishable from each other. Hence, the blue luminosity is a 'good' observable to use for normalization of the CO and far–infrared luminosities. We find no statistically significant difference in the molecular gas surface density of the two samples, nor of the $L_{\rm FIR}/M_{\rm H_2}$ ratio. Why are the two samples so similar? It is possible that although the HDS galaxies are in a higher density environment the tidal interaction has not yet taken place. Our results suggest that tidal forces which will affect galaxy evolution become important only when galaxies are in a very strong interaction, such as in close pairs of galaxies. Due to the relatively small sample, these results should be viewed with caution. For instance, the presence of an AGN in HDS galaxies could increase the $L_{\rm B}$, artificially lowering the average $L_{\rm FIR}/L_{\rm B}$ ratio.