at 13 Gyr, while the 7 kpc track reaches this value at less than 1 Gyr, whereas the same ΔO value for both tracks occurs at a similar μ value. The small differences in ΔO, ΔY, and ΔC at a given μ value come from: (a) the delay in the C and He enrichment of the ISM due to LIMS, (b) the shape of the SFR, and (c) the differences between the HWY and LWY. In Figure 6 we also present the SFR behavior. It can be seen that for $r = 7$ kpc the SFR is not only different in shape to the one at $r = 17$ kpc but it is from one to two orders of magnitude higher.

From the HWY model it has been found that about half of ΔY and ΔC have been formed by LIMS and half by MS, (see Figure 3 of Carigi et al. 2005, and Figure 6 of Paper I), while most of the ΔO has been formed by MS. LIMS produce a very small amount of O according to yields by different authors (see Figure 7 of Karakas & Lattanzio 2007). In this paper we are using the yields by Marigo and collaborators (1996, 1998). For the LWY model the fractions of ΔY and ΔC due to MS are similar but smaller than for the HWY model. The similar fraction of C and He produced by MS and LIMS is also responsible for the behavior in Figures 4 and 5, where it can be seen that the $\Delta Y/\Delta O$ and the $\Delta C/\Delta O$ relations are similar for the HWY model and for the LWY model for $\Delta O < 5 \times 10^{-3}$.

5. INTERMEDIATE WIND YIELDS

From Figures 1–5 we conclude that the HWY and LWY models are in very good agreement with some of the data, but for other data the agreement is only fair. To improve the agreement with the observations, we suggest the use of intermediate wind yields (IWY) for the computation of the chemical evolution models. We define the IWY as the average of HWY and LWY.

In Figure 7 we present the chemical abundance predictions derived from the IWY model for the most critical observations. In particular, we stress the remarkable fit of the model with the observed values for: (a) the present-day ($t = 13$ Gyr) C/O gradient in the $6 < r(\mathrm{kpc}) < 11$ range with the gradient derived from Galactic H II regions; (b) the $t = 13$ Gyr and $r = 7$ kpc ΔY, and ΔO values with those of M17; (c) the $t = 13$ Gyr and $r = 7$ kpc ΔC, and ΔO values with the average of the M17 and M20 values; (d) the $t = 13$ Gyr and $r = 8$ kpc ΔC, and ΔO values with the average values for NGC 3576, and Orion, and for young F and G stars of the solar vicinity; (e) the $t = 8.5$ Gyr and $r = 8$ kpc ΔY, ΔC, and ΔO values with the protosolar values.

The fits presented in Figure 7 imply that the effects of migration have not been very important in the chemical history of the Galaxy. A similar conclusion on the migration effects for the solar vicinity has been found by Navarro et al. (2011) based on the kinematic properties and the metallicity of thin disk stars.

6. POSSIBLE IMPLICATIONS FOR OTHER SYSTEMS

In is important to study how general is the chemical evolution model derived for the disk of the Galaxy, and to explore its relationship with other spiral galaxies and the transition region between the disk and the bulge of the Galaxy. In what follows we present a preliminary discussion of these two topics.

6.1. *Other spiral galaxies*

Since the IWY model successfully reproduces the He, C, and O abundances in the Galactic disk and in the solar vicinity, we want to extend our study to other spiral galaxies with abundances determined by recombination lines in H II regions.

In Table 1 we collect the gaseous abundances of eight extragalactic H II regions belonging to four spiral galaxies: M31, M33, M101, and NGC 2403 (Esteban et al. 2002, 2009). We have included dust corrections identical to those considered for Galactic H II regions. Consequently, these data are consistent with the Galactic data used in our previous figures (e.g., Figure 7). In Table 1 we show the name and type of the host galaxy, and the name and the galactocentric distance of each extragalactic H II region.

In Figure 8 we show the present-day C/O and O/H values for $r = 4, 5, ..., 15, 16$ kpc (from right to left) predicted by the IWY model of the Galactic disk and the extragalactic H II regions values shown in Table 1.

We notice that in the C/O-O/H relation presented in Figure 8: (a) the spiral galaxy disks have a behavior similar to that of the Milky Way disk; (b) all the extragalactic H II regions of the sample are well reproduced by IWY models; and (c) we see the effect of the Z dependent yields for $12+\log(\mathrm{O/H}) > 8.4$. More determinations of the O/H and C/H ratios in extragalactic H II regions with $12+\log(\mathrm{O/H})$ values < 8.4 and > 8.8 are needed to further test the yields.

Since the general C/O-O/H trend of the extragalactic H II regions can be addressed using the results of the GCE model, we suggest that the four extragalactic spiral galaxies have a similar IMF, no selective outflows, and probably an inside-out formation scenario like our galaxy.