

TP-AGB STARS AND POPULATION SYNTHESIS MODELS

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Using updated evolutionary tracks for TP-AGB stars from the Padova Group we explore by means of Monte Carlo Simulations to what extent the Luminosity Functions and color distributions of TP-AGB stars in the LMC and SMC observed by the *SAGE* collaboration can be reproduced with these tracks. We compute as well the gas and dust production rate by TP-AGB stars in these galaxies, and derive the amount of gas and dust expelled by these stars during the past few Gyr. Detailed comparison with observations allow us to quantify the uncertainties introduced in population synthesis models by the use of these evolutionary tracks. We show that current models provide a better description of nature than previous versions. As illustration, Figs. 1 and 2 show the *K* band LF of TP-AGB stars in the LMC and SMC, respectively, compared to the *SAGE* data set (Srinivasan et al. 2009). In these plots the left panel corresponds to all the TP-AGB stars in the simulated galaxy. In the central and right panels only the O-rich and C-rich TP-AGB stars are shown, respectively. For the simulations we assumed the Salpeter IMF and $Z = 0.008$ isochrones. The *heavy gray-line* corresponds to the *SAGE* LF. The *heavy black-line* corresponds to the simulation LF using the central value of the SFH derived for both the LMC and the SMC by Harris and Zaritsky. The bracketing *light black-lines* correspond to the upper and lower limit of the SFH derived from the error bars in the SFH. GBA acknowledges support from UNAM through grant IB102212-RR182212.

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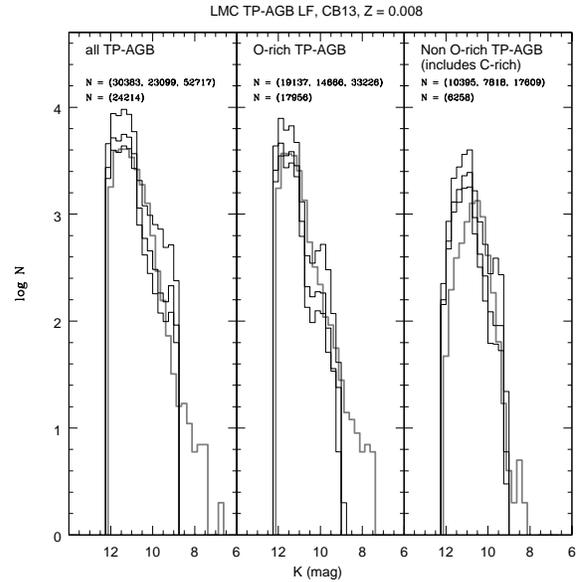


Fig. 1. *K*-band LF derived from our Montecarlo simulations of the SFH of the LMC, compared to the *SAGE* data set.

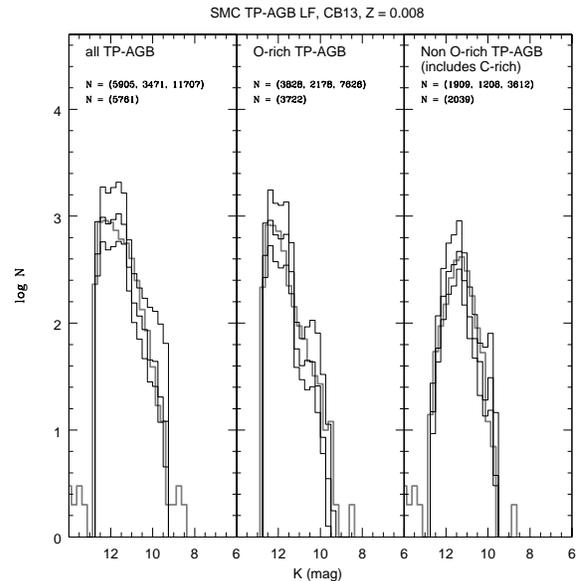


Fig. 2. *K*-band LF derived from our Montecarlo simulations of the SFH of the SMC, compared to the *SAGE* data set.