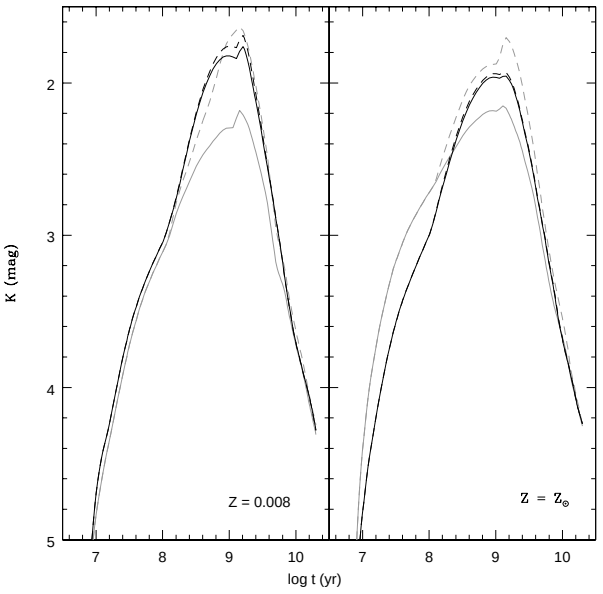

Fig. 1. Behavior of the absolute K magnitude for various models for $Z = 0.008$ (left frame) and $Z_{\odot}$ (right frame). The black solid line corresponds to a CB11 model which includes the effects of mass loss on the spectral distribution of TP-AGB stars. The black dashed line corresponds to the same model, but ignoring the effects of mass loss on the spectral distribution of TP-AGB stars (see text). The gray solid line corresponds to the BC03 model and the gray dashed line to the CB07 model. To build these models I have assumed the Chabrier (2003) IMF and an exponentially decaying star formation rate with $\tau = 1$ Gyr.

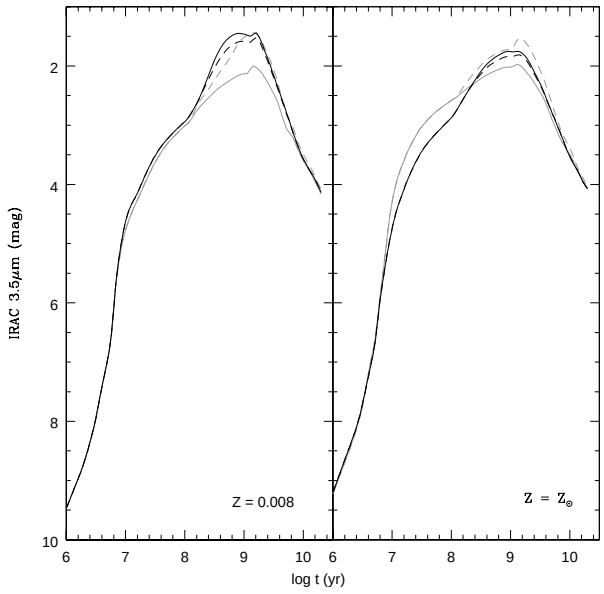

Fig. 2. Behavior of the absolute $IRAC$ 3.5μm magnitude for various models for $Z = 0.008$ (left frame) and $Z_{\odot}$ (right frame). The black solid line corresponds to a CB11 model which includes the effects of mass loss on the spectral distribution of TP-AGB stars. The black dashed line corresponds to the same model, but ignoring the effects of mass loss on the spectral distribution of TP-AGB stars (see text). The gray solid line corresponds to the BC03 model and the gray dashed line to the CB07 model. To build these models I have assumed the Chabrier (2003) IMF and an exponentially decaying star formation rate with $\tau = 1$ Gyr.

and the Aringer et al. (2009) models. A preliminary version of the CB11 models was distributed on demand by Charlot & Bruzual (2007, hereafter CB07). The CB07 models are similar to the BC03 models, except for the use of the Marigo & Girardi (2007) prescription to describe the TP-AGB evolution.

The reader is referred to the paper by Bruzual (2009) for a comparison of the CB11 models with older models. In the rest of this paper I will describe some results from the CB11 models specific to the determination of the mass of galaxies.

2. THE MASS OF GALAXIES

The estimates of the age and mass of the stellar population present in a galaxy depend critically on the ingredients of the stellar population model used to fit the galaxy spectrum. In particular, the treatment of the thermally pulsing asymptotic giant branch (TP-AGB) phase of stellar evolution is the major source of uncertainty in the determination of the spectroscopic age and mass of high-z ($1.4 < z < 2.7$) galaxies. The mid-UV spectra of these galaxies indicate ages in the range from 0.2–2 Gyr, at which the contribution of TP-AGB stars in the rest-frame near-IR sampled by the *Spitzer Space Telescope* is expected to be at maximum. TP-AGB stars dominate the K-band luminosity in simple stellar populations of age ≈1 Gyr. Mass estimates of galaxies with dominant stellar populations in this age range thus depend critically on the treatment of TP-AGB stars in population synthesis models. See Bruzual (2007) for more details.

2.1. *TP-AGB Stars*

The CB11 models are formally identical to the BC03 models, but include several important improvements. CB11 use the tracks up to 15 $M_{\odot}$ from the models with updated input physics by Bertelli et al. (2008). For stars more massive than 15 $M_{\odot}$, in the range from 20 to 120 $M_{\odot}$, CB11 use the so-called Padova 1994 tracks. In the CB11 models the TP-AGB evolution of low- and intermediate-mass