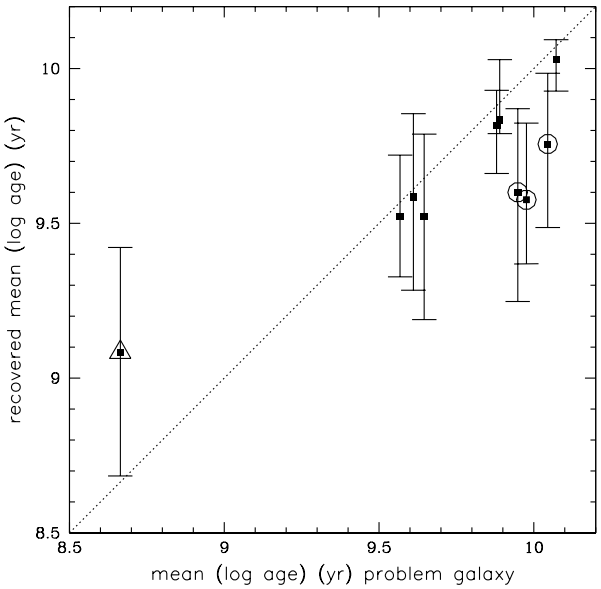

Fig. 1. Best estimate of age, compared to the true value. The error bars indicate the 16−84 percentile range in the recovered distribution of this parameter.

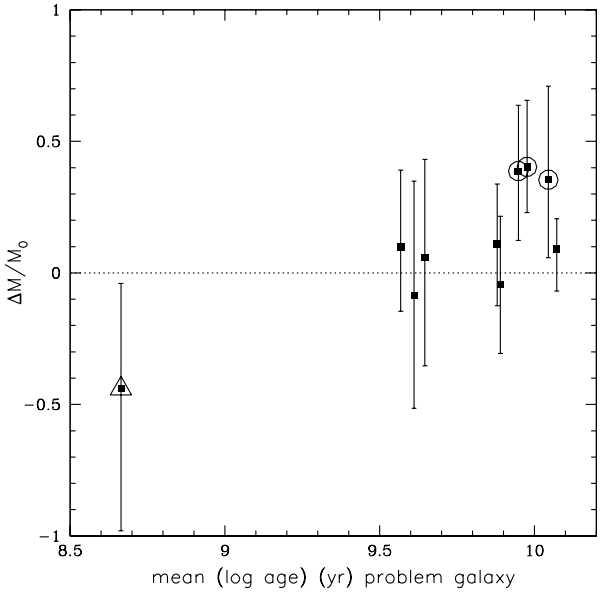

Fig. 2. Relative mass difference between our best estimate and the true value, $(M_{\rm recovered} - M_{\rm true})/M_{\rm true}$, as function of true age. The error bars correspond to the 16−84 percentile range in the recovered distribution of this difference.

function $\exp|1-\chi^2|$, and the associated confidence interval to be the 16−84 percentile range.

3. RESULTS

In Figure 1 we compare our best estimate of age to the true value for the 10 mock galaxies in our sample, and in Figure 2 we show the fractional difference between our best estimate of mass and the true value as a function of mean age. We can see that the mass and the mean age are, in general, well recovered parameters. However, some galaxies show an uncertainty as large as a factor of 2 in the age, and of 2.6 in mass (points marked as circles and triangle in Figures 1 and 2). These galaxies have an important fraction of young stars in their stellar population. The galaxy marked with a triangle has been actively forming stars since its birth, with a mean stellar age of 4.6×10^8 yr, additionaly, it experienced a massive burst of star formation that duplicated its mass, 10^8 yr ago. On the other hand, circled points represent galaxies with a dominant population of old stars, that underwent an intense burst of 10% of the total galaxy mass in the last 10^8 yr, or a less massive, 1% of the galaxy mass, but more recent burst, 2×10^7 yr ago. In any case, the burst doesn't significantly change the mean age of the galaxy but leaves a mark in the spectral energy distribution.

4. CONCLUSIONS

We conclude that from inverse population synthesis models, the mass and mean galaxy age can be estimated with a 10−15% accuracy for the quiescently star forming galaxies. For galaxies with a present day active star formation rate, or that underwent a recent burst, the uncertainty can become as large as a factor of 2 in age and a factor of 2.6 in mass.

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