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ASSESSMENT OF THE SFH RETRIEVED FROM $U'G'R'I'Z'$ PHOTOMETRY USING DynBaS

A. J. Mejía,[1,2] and G. Magris[2]

We present a progress on the evaluation of uncertainties and biases on the determination of the stellar mass, mean stellar age and dust extinction retrieved from broadband (rest-frame) $u'g'r'i'z'$ photometry using a non-parametric SED fitting method named DynBaS (Magris et al. in prep.). We show that the so called template mismatch, can be successfully avoided, providing better recovery even if only optical broadband photometry is fitted.

Our procedure here is as follows: (1) a Synthetic Spectral Atlas of Galaxies (SSAG) is constructed following the Chen et al. (2012) recipe; (2) a sample of SEDs drawn from the SSAG is perturbed 100 times with an observational motivation, in order to mimic the SDSS imaging data; and (3) DynBaS is fed with the perturbed SEDs and the output is compared with the (already known) input physical properties.

The main difference of the present analysis against those in the literature (e.g. Lee et al. 2009; Pforr et al. 2012; Mitchell et al. 2013), is that we use a SED fitting algorithm, which *dynamically* chooses, from a fixed set of SSP models, such ingredients that mixed into a linear combination, the resulting SED is equivalent (in a χ^2 sense) to the input one. Though this algorithm is similar to those of fixed base (e.g. Cid Fernandes et al. 2005) in that it allows arbitrarily complex SFHs (it is a non-parametric algorithm), it is different in that it keeps at minimum the number of SSP models combined, and thus, the solution is as unique as possible while the effects of the well-known degeneracies are reduced.

In Figure 1 we compare our results with those achieved in the works mentioned above, where used a parametric SED fitting method on optical+NIR broadband photometry of mock galaxies. The main source of biases in those works is what they call "template mismatch", which is a consequence of assuming a SFH model (usually a τ-declining) distribution intended to be fitted to the data, where arbitrarily complex SFHs are allowed. Our main source of biases is the lack of information by fitting only the optical wavelength range, which turn out to raise the mass-age degeneration and produce a big dispersion in the recovery of these parameters.

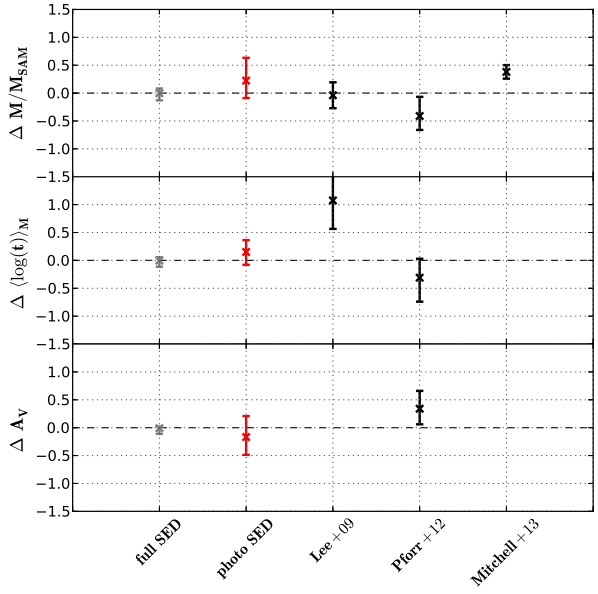

Fig. 1. Comparison between our results (red errorbars) and that of other works (black errorbars). As reference, we show the results of the full optical SED fitting using the same procedure (grey errorbars).

In the following, we will broaden the wavelength coverage by adding NIR photometry, which is expected to provide a better determination of the mass, and incidentally a better determination of the mean age, lifting this way the mass-age degeneration.

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[1]Centro de Investigaciones de Astronomía, AP 264, Mérida 5101-A, Venezuela (mejia@cida.ve).
[2]Posgrado en Física Fundamental, Universidad de Los Andes, Mérida, Venezuela.