Spatially-resolved stellar populations of nearby galaxies in multi-filter surveys

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Abstract. We have developed a new technique using a novel approach to analyze unresolved stellar populations of spatially-resolved galaxies based on large sky multi-filter surveys. We have successfully applied this technique to 42 early-type galaxies in the ALHAMBRA survey. In agreement with some previous work, we find the gradients of early-type galaxies to be on average slightly positive in age and negative in metallicity at large radii ($R > Reff$). These mildly negative metallicity gradients support a merging scenario. The positive/flat age gradients could support a more uniformly distributed star formation or even secondary burst triggered by mergers.

Keywords. galaxies: photometry - galaxies: elliptical - galaxies: evolution - galaxies: formation

1. Introduction

A combination of a Voronoi tessellation with spectral fitting diagnostics has opened a new way to disentangle the stellar population of spatially-resolved local galaxies. With 20 medium-band (300Å) in the optical range and 3 broad-band filters in the near-infrared, we have tested the IFU-like capabilities of the ALHAMBRA survey. We have applied a Voronoi tessellation to 42 early-type galaxies. This tessellation is needed to increase the signal-to-noise ratio in the faint outskirts of the galaxies. The SED fitting code MUFFIT (Díaz-García *et al.* (2015)) has been applied to each tessellation cell. This method provides us with mass- and luminosity-weighted maps of age, metallicity and extinction (Fig. 1) for all early-type galaxies located at z <0.3.
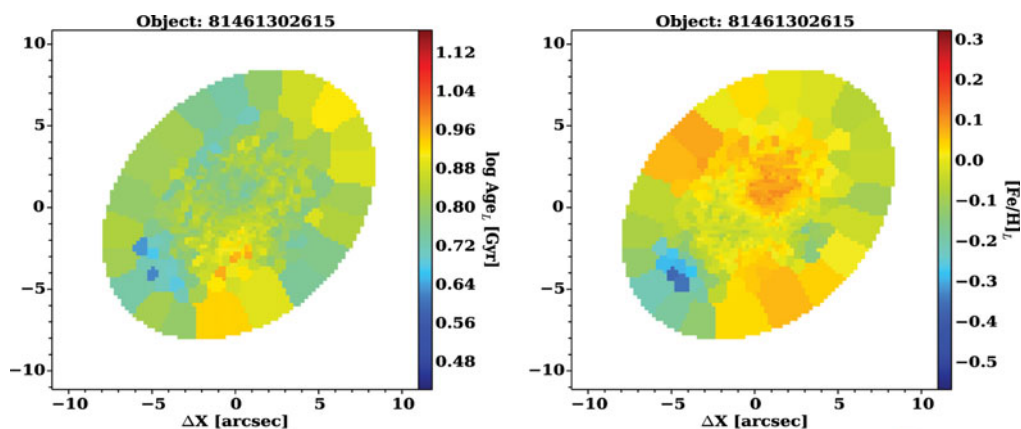

Figure 1. Example of stellar populations luminosity-weighted maps (Age and [Fe/H]).

References

Díaz-García, L. A., Cenarro, A. J., Lopez-Sanjuan, C., *et al.* 2015, *A&A*, 582, A14