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Gas and stellar metallicity gradients in face-on disc galaxies

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Abstract. We present an analysis of the stellar and gaseous metallicity gradients in a sample of 260 disc galaxies from the CALIFA survey. The slope of the different components are compared with the main characteristics of the galaxies, such as mass, morphology, presence of a bar, or gas fraction.

Keywords. galaxies: stellar content, galaxies: evolution, galaxies: abundances

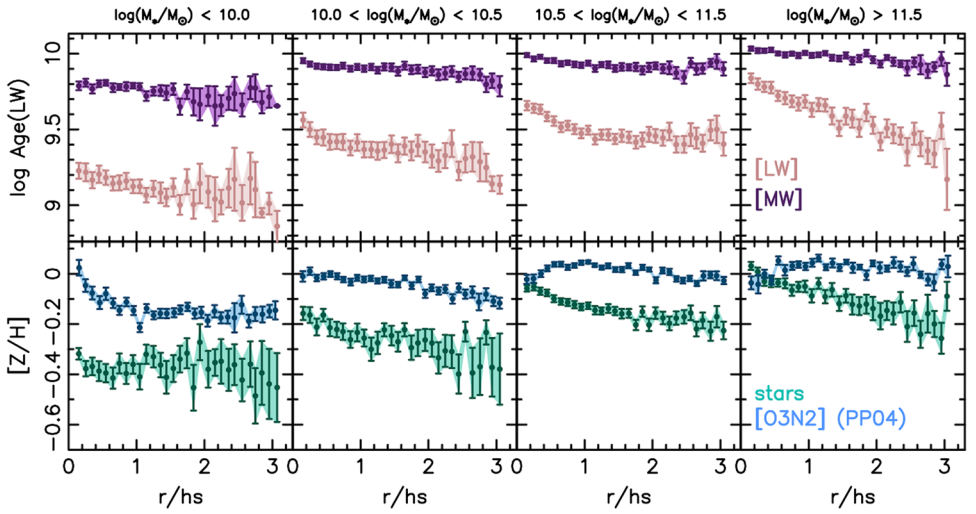

Figure 1. Top panel: mean gradients of stellar age. Bottom panel: mean metallicity gradients for the stellar (blue) and gaseous compoennts (green).

While studies of gas-phase metallicity gradients in disc galaxies are common, very little has been done in the acquisition of stellar abundance gradients. Furthermore, very rarely the gradients of both components are compared for the same galaxies (although see Lian *et al.* 2018). We present here an analysis of the stellar populations and gas-phase metallicities for a sample of 260 galaxies from the CALIFA survey Sanchez *et al.* (2012). Fig. 1 shows the mean metallicity gradient for galaxies in different mass bins. The mean stellar age and metallicity gradients in the disc are shallow and negative. If normalised to the scale-length of the disc, they do not show clear trends with the mass or the presence of a bar although there are some weak trends with the gas fraction or the morphology. On average, gas-phase metallicity gradients are flatter than those of stars. The majority of the stars in the disc (at least up to 4 scale-lengths) are old, although

there is a larger percentage of young stars at larger radii, which is compatible with the inside-out formation scenario.

References

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