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Stellar mass-to-light ratio gradients in galaxies: correlations with mass

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We analyze the stellar mass-to-light ratio (M/L) gradients in a large sample of local galaxies taken from the Sloan Digital Sky Survey, spanning a wide range of stellar masses and morphological types. As suggested by the well known relationship between M/L ratios and colors, we show that M/L gradients are strongly correlated with colour gradients, which we trace to the effects of age variations. Stellar M/L gradients generally follow patterns of variation with stellar mass and galaxy type that were previous found for colour and metallicty gradients. In late-type galaxies M/L gradients are negative, steepening with increasing mass. In early-type galaxies M/L gradients are shallower while presenting a two-fold trend: they decrease with mass up to a characteristic mass of $\M* \sim 10^{10.3} M_{sun}$ and increase at larger masses. We compare our findings with other analyses and discuss some implications for galaxy formation and for dark matter estimates.

Submission history

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