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Cosmography through the ages of low-redshift early-type galaxies

Tuesday 9 September 2025 16:00 (30 minutes)

Using Early Type Galaxies (ETGs) ages as cosmic chronometers has been recently revisited as a model independent way to determine the Hubble parameter, through the inspection of their Lick indices. We present a cosmographic analysis of the ages of SDSS Legacy ETGs, aiming at a novel continuous fit of the Hubble parameter along the redshift range of the data.

We introduce a robust stacking procedure to enhance the signal-to-noise ratio of the spectra, rendering the estimated ages much more reliable. Stellar ages are subsequently derived using two independent SPS models, which are then fit with a second order Taylor expansion in y -redshift $y = z/(1+z)$ of the Hubble parameter $H(z; H_0, q_0, j_0)$. We obtain estimations for the Hubble constant H_0 , deceleration q_0 and jerk j_0 parameters. Notably we find $H_0 = 69.5^{+4.3}_{-7.4}$, and the overall sampling of $H(z)$ is competitive wrt to punctual estimations from the literature.

Following these results, higher- z work with (e)BOSS data is ongoing.

References

Cosmography via stellar archaeology of low-redshift early-type galaxies from SDSS (submitted for revision at Astronomy & Astrophysics)

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Track Classification: The current Cosmological Model and its Tensions (Theory and observations)