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Studying Stellar Populations of Luminous Red Galaxies to probe the Hubble Parameter $H(z)$

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Abstract content
 (Max 300 words)
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There have been a number of attempts to measure the expansion rate of the Universe using age-dating of Luminous Red Galaxies (LRGs). Assuming that stars in LRGs form at the same time, age-dating of two populations of LRGs at different redshifts can provide an estimate of the time difference associated with the corresponding redshift interval (dz/dt). This gives a direct estimate of the Hubble parameter $H(z)$ at the average redshift of the two populations. We explore the validity of this method by using two different sets of data. Firstly, we select a homogeneous sample of passively evolving galaxies over $0.10 < z < 0.40$ from the Sloan Digital Sky Survey Data Release Seven (SDSS-DR7) catalogue by applying a refined criteria, which is based on absolute magnitude. Secondly, we carry out series of observations on the Southern African Large Telescope (SALT) to obtain spectra of LRGs at two narrow redshift ranges $z = 0.40$ and $z = 0.55$ in order to calculate the Hubble parameter $H(z)$ at $z = 0.47$. We utilise two distinct methods of age-dating including the use of absorption Lick index lines and full spectral fitting on high signal-to-noise galaxy spectra from our sample. The results of $H(z)$ estimates using the two different datasets will be presented as well as the cosmological constraints.

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Level for award (Hons, MSc, PhD, N/A)?

No

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Yes

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