

BAO measurement based on Ly α forests

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Just after inflation, due to the coupling between photons and baryons, sound waves were created and propagated in the primordial plasma until recombination. At that time, these so called Baryonic Acoustic Oscillations (BAO) left their imprint in the matter distribution. This feature is still measurable as a small excess (1%) in the matter 2-point correlation function.

This BAO peak can be measured both transversely and radially. The transverse measurement yields the ratio of the angular-diameter distance to the sound horizon scale at recombination ($d_A(z)/r_s$), while the radial measurement gives access directly to the expansion rate through the quantity $H(z)r_s$.

First detected in the Luminous red galaxy correlation function at redshifts between 0.16 and 0.47 (Einsele et al., 2005 and Cole et al., 2005), other matter tracers have since been used to access other redshift ranges. The highest redshift measurement has been performed at $z = 2.34$, using the Ly α forests seen in high redshift quasar spectra.

I will present the latest BAO measurement based on Ly α forests at mean redshift 2.34 using the SDSS-IV – eBOSS data. This analysis yields 3.3 % and 4.4 % precision on the measurements of the $H(z)r_s$ and $d_A(z)/r_s$ respectively.

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