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Lyman-alpha correlations from early DESI data

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The Dark Energy Spectroscopic Survey (DESI) will during its operation observe the spectra of 10s of millions of galaxies and quasars. Already, the largest ever 3D map of the universe has been created from combined Survey Validation (SV) and Main Survey data. Around one third of the total quasar sample will be observed at redshifts greater than ~2, where we can use the Lyman-alpha (Lya) forest (a region of strong absorption between the Lyman-beta and Lya emission lines) to measure baryon acoustic oscillations (BAO) at an effective redshift of z ~ 2.3. In my talk I will briefly detail how we go from raw quasar spectra to the 3D correlation functions used in Lya BAO measurements. These include the Lya auto correlation, where Lya forest pixels from different lines-of-sight are correlated, and the Lya-quasar cross correlation, where pixels in the Lya forest are correlated with quasars at all redshifts. I will also present results from the most recent stable DESI data release, used to form the basis of the first Lyman-alpha Woking Group main paper of which I am a lead author.

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