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## Effect of the Metallicity of the Intergalactic Medium in the Lyman- $\alpha$ Forest Correlation Function

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The Lyman- $\alpha$  ( $\text{Ly}\alpha$ ) forest allows to constraint cosmological parameters at  $z > 1.8$  using the technique of standard rulers determined by Baryon Acoustic Oscillations (BAO). This makes it an important tracer for the study of the Universe at high redshift. For this work several synthetic datasets have been generated to understand the astrophysical effects and contaminants that contribute to the shape of the  $\text{Ly}\alpha$  flux correlation function  $\xi_{\text{Ly}\alpha}$ , and to be able to reproduce the correlation function measured with data spectra from different galaxy surveys (eBOSS and DESI). Among these phenomena the presence of metals in the Intergalactic Medium (IGM) translate into an important bias in the  $\xi_{\text{Ly}\alpha}$  with respect to the  $\xi_{\text{Ly}\alpha}$  calculated considering an only Hydrogen in the IGM. In this work we study the influence of the metallicity in  $\xi_{\text{Ly}\alpha}$ , simulating the presence of four Si transitions in synthetic spectra developed in preparation for DESI and compared with the data obtained in the DR14 of eBOSS. These results were used for the analysis of eBOSS DR16 and are currently being used for the analysis of the first data release of DESI.

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