
Measuring large-scale UV background inhomogeneities with the HeII forest and metals

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Abstract

I will present an analysis combining the measurement of the Lyman-alpha forest in both Helium II and Hydrogen I. We infer the parameter eta from their opacity ratio, which is thought to be sensitive to large-scale inhomogeneities in the extragalactic UV background (and so star formation and quasar activity). We test this assertion by making observations of oxygen-IV (OVI) absorption using the pixel optical depth method, since OVI is also thought to be sensitive to the UV background. We make splits of the OVI sample based on high/low eta smoothed on various scales. We find that the OVI signal is indeed sensitive to this ratio on comoving smoothing scales $\sim 5-17$ Mpc in the expected manner (stronger OVI with a lower eta and both reflecting a harder UVB). We also find a weaker OVI signal in the HeII Gunn-Peterson trough compared to both high and low eta samples again consistent with a softer UVB background.

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