Probing the IGM during Reionization with line cross-correlations

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Abstract

Intensity mapping opens up an exciting window for probing both astrophysics and cosmology during the Epoch of Reionization, with power and cross power spectra of line fluctuations testing models over a large range of scales and redshifts. We simulate cosmological volumes of 21-cm, Lyman-alpha and H-alpha line fluctuations and use their cross-correlations to probe properties of the IGM. The signal-to-noise of the cross-signal is predicted for SKA together with the proposed cosmic dawn intensity mapping (CDIM) satellite. In addition, these results for intensity mapping are compared to cross-correlation synergies of the 21-cm signal with surveys of Lyman-alpha emitters.

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