

Cross-correlating patchy kSZ with other probes of reionization

Thursday, 12 August 2021 12:45 (15 minutes)

The kinematic Sunyaev-Zel'dovich (kSZ) effect contains a contribution from the inhomogeneous reionization process, and encodes valuable information about how reionization progressed. We examine several upcoming opportunities for cross-correlating the kSZ signal with other probes of Cosmic Dawn and the Epoch of Reionization. Specifically, we look at the 21cm signal, measured by radio interferometers such as HERA and the SKA, and wide-field high-redshift galaxy surveys, such as those from the Nancy Grace Roman Space Telescope. We show that in the sample variance-limited regime, a statistically significant cross-correlation signal is present. However, contamination from other signals, such as the primary CMB, may present observational difficulties. In particular, the foreground contamination for the 21cm signal presents a unique challenge that must be overcome to make a detection. We talk about potential methods for overcoming these difficulties, as well as prospects for future experiments.

Primary author: LA PLANTE, Paul (UC Berkeley)

Presenter: LA PLANTE, Paul (UC Berkeley)

Session Classification: From the Dark Ages to Reionization with CMB-S4