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Detection of Cosmological 21 cm Emission with CHIME

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Intensity mapping of the 21 cm emission line from neutral hydrogen (HI) is a promising method to efficiently map the large-scale structure of the Universe out to high redshift. The Canadian Hydrogen Intensity Mapping Experiment (CHIME) is a radio interferometer specifically designed for this purpose. CHIME recently reported the detection of 21 cm emission from large-scale structure between redshifts 0.8 and 1.4. This was achieved by stacking maps of the radio sky, constructed from 102 nights of CHIME data, on the angular and spectral locations of luminous red galaxies, emission line galaxies, and quasars from the eBOSS clustering catalogs. In this talk, I will introduce the experiment and provide an overview of the detection. I will describe key aspects of the both the data processing pipeline and the simulation pipeline used to model the stacked signal. I will discuss the implications of the detection. Finally, I will evaluate the prospects for using CHIME to measure the power spectrum of 21 cm emission, identify the signature of baryon acoustic oscillations, and constrain dark energy.

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