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Title:	Prospects of Detecting HI using Redshifted 21-cm Radiation at $z \sim 3$
Authors:	Bagla, J.S. (/jspui/browse?type=author&value=Bagla%2C+J.S.)
Keywords:	post-reionization galaxies Redshifted 21
Issue Date:	2017
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Citation:	Journal of Astrophysics and Astronomy, 38(1)
Abstract:	<p>Distribution of cold gas in the post-reionization era provides an important link between distribution of galaxies and the process of star formation. Redshifted 21-cm radiation from the hyperfine transition of neutral hydrogen allows us to probe the neutral component of cold gas, most of which is to be found in the interstellar medium of galaxies. Existing and upcoming radio telescopes can probe the large scale distribution of neutral hydrogen via HI intensity mapping. In this paper, we use an estimate of the HI power spectrum derived using an ansatz to compute the expected signal from the large scale HI distribution at <math>z \sim 3</math>. We find that the scale dependence of bias at small scales makes a significant difference to the expected signal even at large angular scales. We compare the predicted signal strength with the sensitivity of radio telescopes that can observe such radiation and calculate the observation time required for detecting neutral hydrogen at these redshifts. We find that OWFA (Ooty Wide Field Array) offers the best possibility to detect neutral hydrogen at <math>z \sim 3</math> before the SKA (Square Kilometer Array) becomes operational. We find that the OWFA should be able to make a <math>3\sigma</math> or a more significant detection in 2000 hours of observations at several angular scales. Calculations done using the Fisher matrix approach indicate that a <math>5\sigma</math> detection of the binned HI power spectrum via measurement of the amplitude of the HI power spectrum is possible in 1000 h</p>
Description:	Only IISERM authors are available in the record.
URI:	<a href="https://link.springer.com/article/10.1007/s12036-017-9436-y">https://link.springer.com/article/10.1007/s12036-017-9436-y</a> ( <a href="https://link.springer.com/article/10.1007/s12036-017-9436-y">https://link.springer.com/article/10.1007/s12036-017-9436-y</a> ) <a href="http://hdl.handle.net/123456789/2639">http://hdl.handle.net/123456789/2639</a> ( <a href="http://hdl.handle.net/123456789/2639">http://hdl.handle.net/123456789/2639</a> )
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