the iterative process. The transitions $1_{10} - 1_{11}$ 4.830 GHz and $2_{11} - 2_{12}$ at 14.488 GHz are found to show in absorption against Cosmic Microwave Background (CMB).

Extra-galactic astronomy and cosmology

Gravitational collapse in an expanding background and the effect of small scale perturbations on large scales

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Abstract. We study the effect of perturbations at small scales on collapse of perturbations at large scales in gravitational clustering in an expanding universe. Earlier studies have shown that this effect is small in most cases. Our aim is to quantify this effect and to develop an understanding of cases where the effect is not small. We find that adding fluctuations at small scales affects collapse of perturbations at large scales only if a k^4 tail from small scales adds significantly to the power spectrum at large scales.

Reionization of the Universe

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Abstract. Wilkinson Microwave Anisotropy Probe observation of Cosmic Microwave Background Radiation shows that the redshift of reionization of Intergalactic Medium is 20 ± 9. On the other hand the spectra of high redshift objects like quasars show the presence of significant amount of neutral hydrogen even at $z \simeq 6$. We construct semi-analytic models of structure formation to study the various issues related to cosmological reionization. In our simple model, we have used the Press-Schechter formalism to get the structure formation history. In this poster we will present the results obtained for standard cosmological model of the universe. We will also show the dependence of redshift of reionization on various parameters viz (i) rate of UV photon production per baryon (depends on initial mass function and star formation rate), (ii) lower limit of virial temperature of the halos which can host star formation and (iii) clumpiness of IGM. Finally we consider the effects of cosmic rays on the thermal evolution of the IGM.