THE ANGULAR CORRELATION FUNCTION OF FAINT GALAXIES DURING THE DECREASING CORRELATION PERIOD

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During the period of galaxy formation, many small-length-scale perturbations superimposed on high-amplitude large-length-scale perturbations should have their overdensities boosted into the non-linear regime, while small-scale perturbations in other regions remain linear. The formation of the first galaxies in discrete, high overdensity regions may lead to an initial amplitude of the spatial correlation function of galaxies, ξ_0, much higher than that expected from linear fluctuation theory. This initially high "bias" would consequently decrease to the near-unity values expected from local observations. Such a Decreasing Correlation Period (DCP) is detected in N-body simulations under certain conditions by several authors; Roukema (1993), Brainerd & Villumsen (1994), Roukema et al. (1997) and unpublished simulations by one of us (Yamashita).

The DCP is parameterized in a simple way; ending at z_t. The DCP effects on w_0, the amplitude of the angular correlation function of faint galaxies, have been estimated and compared with the Hubble Deep Field (HDF) estimate. The DCP is compatible with observation for values of z_t in the theoretically expected range $z_t > 1$ (see Ogawa et al. 1997).

References

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