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The Growth of the Density Fluctuations in the Scale-Invariant Theory VESSELIN GUEORGUIEV[1], IAPS and Ronin Institute for Independent Scholarship, Montclair, NJ, USA, ANDRE MAEDER, Geneva Observatory at the University of Geneva, Switzerland — In the standard model, for a matter dominated universe, the growth of the density perturbations evolves with redshift z like $(\frac{1}{1+z})^s$ with $s = 1$. This is not fast enough to form galaxies and to account for the observed present-day inhomogeneities. This problem is usually resolved by assuming that at the recombination epoch the baryons settle down in the potential well of the dark matter previously assembled during the radiation era of the universe. This view is challenged in the present paper by using the recently proposed model of a scale-invariant framework for cosmology.

From the continuity, Euler, and Poisson equations written in the scale-invariant framework, the equation governing the growth of density fluctuations δ is obtained. Starting from $\delta = 10^{-5}$ at $z \approx 1000$, numerical solutions for various density background are obtained. The growth of δ is much faster than in the standard EdS model. The s are in the range from 2.7 to 3.9 for $\Omega_{\rm m}$ between 0.30 and 0.02. This enables the density fluctuations to enter the nonlinear regime with $\delta > 1$ long before the present time, typically at redshifts of about 10, without requiring the presence of dark matter. [Physics of the Dark Universe **25** (2019) 100315].

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