

Abstract Submitted
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Comparison of Multifractal Behavior in One Dimensional Models of Hierarchical Expansion BRUCE MILLER, Texas Christian University, JEAN-LOUIS ROUET, Universite d'Orleans — Observations of galaxies over large scales reveals the possibility of a fractal distribution of their positions. The assumed source of fractal behavior is the lack of a length scale in the two body gravitational interaction. However, even with new, larger, sample sizes from recent studies, it is difficult to extract information concerning fractal properties with confidence. Similarly, simulations with a billion particles only provide a thousand particles per dimension, far too small for accurate conclusions. With one dimensional “toy models” we can overcome these limitations by carrying out simulations with on the order of a quarter of a million particles. Here we compare the multifractal analysis of a group of one dimensional models which incorporate different features of the equations governing the evolution of a matter dominated universe. The results share some similarities with galaxy observations, such as apparent bifractal geometry. They also provide insights concerning possible constraints on length and time scales for fractal geometry.

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