Cosmology in One Dimension: a Two Component System YUI
SHIOZAWA, BRUCE MILLER, Texas Christian University — In the observable
universe galaxies are grouped in clusters, clusters in super-clusters, and all are sep-
arated by large voids and super-voids. As the majority of the matter content of the
universe is dark matter, it is difficult to understand the hierarchical nature of large-
scale structure from observations alone. We simulated the evolution of two types of
matter, one representing dark matter and the other luminous matter, in a single,
one-dimensional, model universe. Our scale-dependent multifractal analysis com-
pares the distribution of the dissipative component, representing luminous matter,
with the non-dissipative dark matter and reveals important differences. In addition,
we employ a minimum spanning tree (MST) analysis of both matter distributions
to investigate the dynamics and hierarchical properties of clustering.

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