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Banks-Zaks Cosmology and Dark Energy

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A limiting temperature of a species can cause the Universe to asymptote to it yielding a de-Sitter (dS) phase due to macroscopic emergent behavior. The limiting temperature is generic for theories slightly shifted from their conformal point. We demonstrate such behavior in the example of unparticles/Banks-Zaks theory. The unparticles behave like radiation at high energies reducing the Hubble tension and a cosmological constant at low energies yielding a model that follows closely ΛCDM model but due to collective phenomenon. It is technically natural and avoids the no-dS conjecture. The model is free of the coincidence and initial conditions problems, scalar fields, and modified gravity. One of the major predictions is a connection between the equation of state of Dark Energy w, and the number of relativistic degrees of freedom at decoupling N_{eff}. We fit the model to existing supernovae data and derive constraints on the cosmological parameters.

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