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# Life of the homogeneous and isotropic universe in dynamical string tension theories

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Cosmological solutions are studied in the context of the modified measure formulation of string theory , then the string tension is a dynamical variable and the string the tension is an additional dynamical degree of freedom and its value is dynamically generated. These tensions are then not universal, rather each string generates its own tension which can have a different value for each of the string world sheets and in an ensemble of strings. The values of the tensions can have a certain dispersion in the ensemble. We consider a new background field that can couple to these strings, the "tension scalar" which is capable of changing locally along the world sheet and then the value of the tension of the string changes accordingly. When many types of strings probing the same region of space are considered this tension scalar is constrained by the requirement of quantum conformal invariance. For the case of two types of strings probing the same region of space with different dynamically generated tensions, there are two different metrics, associated to the different strings. Each of these metrics have to satisfy vacuum Einstein's equations and the consistency of these two Einstein's equations determine the tension scalar. The universal metric, common to both strings generically does not satisfy Einstein's equation . The two string dependent metrics considered here are flat space in Minkowski space and Minkowski space after a special conformal transformation. The limit where the two string tensions are the same is studied, it leads to a well defined solution. If the string tension difference between the two types of strings is very small but finite, the approximately homogeneous and isotropic cosmological solution lasts for a long time, inversely proportional to the string tension difference and then the homogeneity and and isotropy of the cosmological disappears and the solution turns into an expanding braneworld where the strings are confined between two expanding bubbles separated by a very small distance at large times. The same principle is applied to the static end of the universe wall solution that lasts a time inversely proportional to the dispersion of string tensions. This suggest a scenario where quantum fluctuations of the cosmological or static solutions induce the evolution towards braneworld scenarios and decoherence between the different string tension states.

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