Phenomenology of Cosmic Supertrings with Moduli-Dependent Tension

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Abstract

This talk explores the phenomenology of cosmic superstrings with moduli-dependent tensions. In the low energy EFTs of String Theory, these emerge as either fundamental (F-) strings or effective strings from branes wrapping internal cycles. If moduli evolve in the Early Universe, the string tension inherits a time dependence, which can be constrained via Swampland bounds on the variation of the EFT cutoff in field space. This translates to a bound on the spectral index of the gravitational wave spectrum emitted by a scaling network of such strings. The field dependence of the tension has other interesting phenomenological consequences: isolated loops of F- or effective strings can grow in comoving size and percolate into a network; moreover, a gas of string loops could help the volume modulus settle at its late-time minimum, preventing overshoot.

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