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Cosmic superstrings in large volume compactifications: PTAs, LISA and time-varying tension

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The Stochastic Gravitational Wave Background (SGWB) from cosmic super- strings offers one of the few known possibilities to test String Theory within current experimental reach. However, in order to be compatible with the existing constraints, the tension of a cosmic superstring network is required to lie several orders of magnitude below the Planck scale. This is naturally realized in string compactifications where the volume of the extra dimensions is parametrically large (in string units). We estimate the GW spectrum arising from cosmic superstrings in such scenarios, providing analytical formulae as well as numerical results and a comparison to observation. Crucially, we do so within a fully-fledged string cosmology, taking into account various modified cosmological epochs (such as kination or early matter domination) induced by the presence of moduli and a time-dependent string tension.

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