High Energy Physics - Theory

The cosmological evolution of p-brane networks

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In this paper we derive, directly from the Nambu-Goto action, the relevant components of the acceleration of cosmological featureless p-branes, extending previous analysis based on the field theory equations in the thin-brane limit. The component of the acceleration parallel to the velocity is at the core of the velocity-dependent one-scale model for the evolution of p-brane networks. We use this model to show that, in a decelerating expanding universe in which the p-branes are relevant cosmologically, interactions cannot lead to frustration, except for fine-tuned non-relativistic networks with a dimensionless curvature parameter $k \\ll 1$. We discuss the implications of our findings for the cosmological evolution of p-brane networks.

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