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The evolution of domain wall network with inflationary fluctuations under the asymmetric potential

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Domain wall networks can induce cosmological problems. Previous work has shown that networks with initial inflationary fluctuations are long-lived despite being under population bias. This is due to large scale correlations, which cannot be seen in white noise case. However, the fate of these networks under potential bias is not well-understood. In our research, we investigate the time evolution of such networks under the linear potential bias using 2 dimensional lattice simulations. We show that the networks have a finite lifespan and collapse when the pressure becomes comparable to the tension they experience. Specifically, we find the relation between the lifetime and the bias strength. This implies that the cosmic domain wall problem is avoidable in certain scenarios.

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