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Gravitational wave spectrum from metastable cosmic string network and the delayed scaling scenario

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Recent observations by pulsar timing arrays (PTAs) such as NANOGrav, EPTA, PPTA, and CPTA suggest the presence of nanohertz stochastic gravitational wave background (GWB), which may be a hint for new physics. Among several possible sources, those from metastable cosmic string would be attractive since the spectral tilt of the GWB can be easily consistent with those suggested in PTAs. However, there are two issues in this scenario; i) it is inconsistent with the non-observations of the stochastic GWB at LVK, ii) it needs fine-tuning in the highest temperature of the Universe to have cosmic string formation without monopole formation. In this talk, I will discuss if cosmic strings are formed during inflation after sufficient dilution of monopoles, they start emitting gravitational waves at relatively later time to avoid the LVK bound. I also show the numerical and analytic evaluation of the shape of the whole GWB spectrum and its parameter dependence.

Collaboration you are representing

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