

Crescendo Beyond the Horizon

More Gravitational Waves from Domain Walls Bounded by
Inflated Cosmic Strings

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[YB, K. Harigaya, L.-T. Wang, arXiv: 2407.17525]

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Essentials of cosmic strings and domain walls

cosmic string



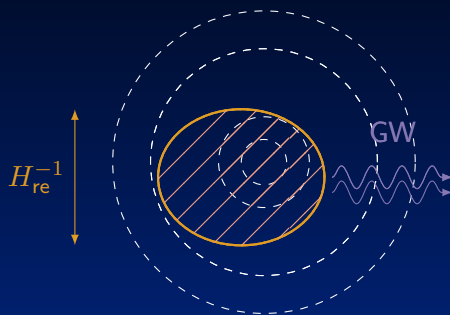
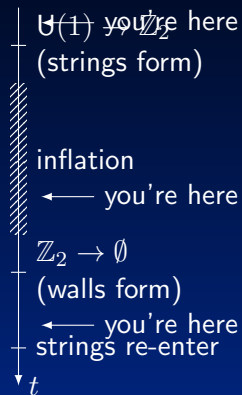
$$E_{\text{str}} \sim \mu L, \quad [\mu] = 2, \quad (1)$$

domain wall



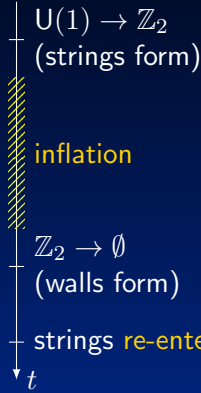
$$E_{\text{wall}} \sim \sigma L^2, \quad [\sigma] = 3. \quad (2)$$

What is the scenario?



Compare to previous studies

without inflation (prev)



U(1) $\rightarrow$ $\mathbb{Z}_2$
(strings form)

$$\Omega_{\text{GW}} h^2 \Big|_{\text{now}} \sim \Omega_{\text{rad}} h^2 \sqrt{\frac{\mu}{M_{\text{Pl}}^2}} \approx 4 \times 10^{-11} \left(\frac{\mu^{1/2}}{10^{13} \text{ GeV}} \right) \quad (3)$$

with inflation (this study)

$$\Omega_{\text{GW}} h^2 \Big|_{\text{now}} \sim \Omega_{\text{rad}} h^2 \sqrt{\frac{\sigma}{M_{\text{Pl}}^2 H_{\text{re}}}} \approx 2 \times 10^{-8} \left(\frac{\sigma^{1/3}}{10^6 \text{ GeV}} \right)^{3/2} \left(\frac{10^{-14} \text{ GeV}}{H_{\text{re}}} \right)^{1/2} \quad (4)$$

Benchmark GW Spectra

