Contribution ID: **48** Type: **Contributed Talk**

Gravitational wave spectrum from expanding string loops on domain walls: Implication to nano-hertz pulsar timing array signal

Tuesday 10 December 2024 14:00 (30 minutes)

We analytically calculate the spectrum of stochastic gravitational waves (GWs) emitted by expanding string loops on domain walls in the scenario where domain walls decay by nucleation of string loops. By introducing macroscopic parameters characterizing the nucleation of the loops, the stochastic GW spectrum is derived in a way that is independent of the details of particle physics models. In contrast to GWs emitted from bubble collisions of the false vacuum decay, the string loops do radiate GWs even when they are perfectly circular before their collisions, resulting in that more and more contribution to the spectrum comes from the smaller and smaller loops compared to the typical size of the collided loops. Consequently, the spectrum is linearly proportional to the frequency at the high-frequency region, which is peculiar to this GW source. Furthermore, the results are compared with the recent nano-Hertz pulsar timing array signal, as well as the projected sensitivity curves of future gravitational wave observatories.

Authors: NAKANO, Wakutaka (KEK); Dr HAMADA, Yu

Presenter: NAKANO, Wakutaka (KEK)

Session Classification: Cosmology