Contribution ID: **20** Type: **not specified**

Axion Dark Matter from Cosmic String Network

Tuesday, 23 July 2024 11:10 (25 minutes)

We perform lattice simulations to estimate the axion dark matter abundance radiated from the global cosmic strings in the post-inflationary scenario. The independent numerical confirmation on the recently observed logarithmic growth in both the number of strings per Hubble patch and the spectral index of the power law scaling for the axion spectrum is reported. These logarithmic scalings are checked against two different prescriptions for generating initial random field configurations, namely fat-string type and thermal phase transition. We discuss a possible strong correlation between the axion spectrum and the string evolutions with different initial conditions to support the insensitivity of scaling behaviors against different initial data and we provide a qualitative understanding of it.
The impact of various combinations of the power law of the axion spectrum, nonlinearities around the QCD scale, and average inter-string distances on the axion abundance are discussed.
Additionally, we introduce a new novel string identification method, based on the tetrahedralization of the space, which guarantees the connectedness of the strings and provides a convenient way of assigning the core location.
Finally we derive a lower bound on the axion mass.

Presenter: Mr KIM, Heejoo (KAIST)

Session Classification: Presentations