

Production of the pion string in a hot and dense quark matter

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During the chiral phase transition, the pion string is predicted to be produced both in the heavy ion collisions and early universe according to the phenomenology of QCD theory. In this talk, we will present our recent studies on the topic of the production rate of the pion string in a hot and dense quark matter. For a second-order phase transition in hot but low density region, We apply the Kibble-Zurek mechanism to estimate how many strings will be produced at a chiral phase transition. On the contrary, for a first-order phase transition in low but high density, we utilize the bubble nucleation theory to give out the number of the pion strings at a phase transition. Our results are of interest in searching of cosmic strings or other topological defects in heavy ion collision experiments and the cosmology.

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