

Production of dark matter axions from global strings

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In light of recent developments of experimental approaches on the search for axion dark matter, it is important to clarify what is the typical theoretical prediction for its mass. The prediction for the axion dark matter mass can be obtained by estimating the relic axion abundance, which is given as a function of the Peccei-Quinn scale. However, the estimation of the axion abundance suffers from huge uncertainty due to the poor understanding of the contribution of axions produced by the decay of global strings. Fortunately, recent numerical approaches enable us to investigate more details on the shape of the spectrum of axions radiated from strings, which gives some clues to resolve the long-standing uncertainty. In this contribution, we review the issue of the production mechanism of dark matter axions and present new results of large scale numerical simulations on the cosmological evolution of global strings. By extrapolating the numerical results, we also discuss the implication for the value of the axion dark matter mass.

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