

Scalars 2017



Contribution ID : 16

Higgs domain walls beyond the Standard Model

Saturday 02 Dec 2017 at 17:15 (00h15')

Content :

The study of the renormalization group improved effective potential of the Standard Model has revealed existence of a local maximum at field strengths of the order of 10^{10} GeV. If the Standard Model is valid for very high energy scales, then the possibility of the production of cosmological domain walls in the early Universe occurs.

We investigated dynamics of networks of domain walls using lattice simulations. In our previous research we assumed that the Standard Model is valid up to the Planck scale. Recently we studied scenario in which the Standard Model breaks down at much lower scales using the formalism of the Effective Field Theory. A nonrenormalizable operator was included in the Lagrangian density and its impact on the evolution of networks of domain walls was investigated. We studied the possibility of a formation of metastable networks for the case of nearly degenerate minima of the potential. The energy spectrum of gravitational waves emitted from Higgs domain walls was determined.

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Session classification : parallel session 4

Track classification : --not yet classified--

Type : --not specified--