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Curved spacetime Effective Field Theory (cEFT) as a tool to investigate vacuum stability

Friday 25 September 2020 17:35 (20 minutes)

I would like to present application of the recently proposed curved spacetime Effective Field Theory (cEFT) to a problem of vacuum stability. To model the matter sector we used two scalar fields coupled through the Higgs portal type of interaction. Additionally, both of these fields were coupled non-minimally to gravity. This may be considered as a simplified model describing an interaction of the real part of the Higgs doublet with the heavy scalar dark matter. To tackle the problem of the false vacuum stability against spontaneous creation of the true vacuum bubble we firstly integrated out the heavy scalar and obtained cEFT for the light field. Then we investigated the influence of the higher order gravity mediated operators on vacuum stability. Results will be discussed in this presentation.

The presentation is based on the paper arXiv:2004.12327, that was written in collaboration with Z. Lalak and A. Nakonieczna.

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