Contribution ID: **43** Type: **Lightning Talk + Poster**

EFT of supercooled phase transitions

Monday 22 April 2024 15:12 (3 minutes)

We present an analysis of the first-order supercooled phase transition associated with symmetry breaking in the early Universe in a classically scale-invariant model. We analyze the role of higher order thermal corrections for these transitions, and to what extent they can be computed using dimensionally reduced effective field theory (3D EFT). This framework requires high temperature (HT) expansion to be valid, which seems challenging due to the presence of supercooling. We show how to reliably use the HT expansion in dimensionally reduced theory for the calculation of bubble nucleation rate.
We compare the obtained results to the results of the most common scheme based on the so-called daisy resummation.
We further compute all of phase transition characteristics, discuss various scenarios of completing the transition and predict resulting gravitational-wave spectra and their observational prospects in future experiments such as LISA.

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Session Classification: Afternoon Session