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Phase transition and Gravitational Waves signal from conformal symmetry breaking

lundi 30 mai 2022 16:30 (20 minutes)

In our work we study the cosmological phase transition (PT) in a conformal extension of the Standard Model (SM). The model considered is called SU(2)cSM, it extends the SM gauge group by an additional hidden $SU(2)_X$ gauge group, and a scalar doublet (whilst singlet under SM gauge group).
Due to the large supercooling –a general feature of the conformal models –a strong gravitational waves (GWs) signal can be generated during the PT.
We carefully investigate the PT, taking into account recent developments in order to improve existing results and provide meaningful information for the forthcoming LISA searches.
We pay attention to accurate computation of phase transition parameters, in particular the time scale of the transition, distinguish between percolation and nucleation temperature of the bubbles, consider different GWs sources such as the bubble collisions and sound waves, discuss the hydrodynamics, i.e possible runaway, and present resulting GW spectra.

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