

Review of: "Mass Creation via the Phase Transition of the Higgs Field"

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Potential competing interests: No potential competing interests to declare.

This manuscript focuses on the Higgs potential of Figure 1, where positive and negative vacuum expectation values appear with equal probability, and discusses the possibility of an eventual emergence of a positive vacuum expectation value. However, the potential in this manuscript is different from the Higgs potential of the standard model (SM), and thus it is essential to discuss how this scenario would be described within the context of the SM. I propose that the authors address the following points in the manuscript: the potential introduction of the terms discussed in the manuscript into the Lagrangian under gauge symmetry, the possible influence of such terms on the decay of various particles, and other related aspects. If the parameter space regarding phase transitions discussed in this paper overlaps with regions avoiding experimental constraints, it may be advantageous to assert this within the manuscript. Furthermore, examining which theories beyond the SM could effectively utilize the analysis presented in this manuscript, and determining whether the parameter realizing first-order phase transitions in the manuscript could be probed by future experiments such as gravitational wave observations, among other considerations, would enhance the level of completion of the manuscript.