

Scalars 2015

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The Higgs, the top and the singlet scalar -- gravity and the stability of the effective potential

Content :

We set out to investigate the stability of the Higgs effective potential in curved spacetime. To this end, we considered the gauge-less top-Higgs sector with an additional scalar field. Using the heat kernel method we derived the one-loop effective action for the model at hand. We found that the lowest order nontrivial gravity induced terms are proportional to the square of the Riemman and the Ricci tensors. Next, we analyzed the changes induced by these terms on the behavior of the effective potential in the small field region (electrovacuum minimum) and on the effective Higgs quartic coupling in the large field region.

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