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A New Approach to Electroweak Symmetry Non-Restoration

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Electroweak symmetry non-restoration up to high temperatures well above the electroweak scale has intriguing implications for (electroweak) baryogenesis and early universe thermal histories. In this talk, I will discuss a new approach for electroweak symmetry non-restoration via an inert Higgs sector that couples to the Standard Model Higgs as well as an extended scalar singlet sector. Examples of benchmark scenarios that allow for electroweak symmetry non-restoration all the way up to hundreds of TeV temperatures, featuring suppressed sphaleron washout factors down to the electroweak scale, will be presented. Renormalization group improvements and thermal resummation, necessary to evaluate the effective potential spanning over a broad range of energy scales and temperatures, have been implemented calculating the thermal history. This method for transmitting the Standard Model broken electroweak symmetry to an inert Higgs sector can be scrutinized through Higgs physics phenomenology and electroweak precision measurements at the HL-LHC.

Summary

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