

Cosmological Phase Transitions in Composite Higgs Models

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We investigate cosmological phase transitions in various composite Higgs models consisting of four-dimensional asymptotically-free gauge field theories. Each model may lead to a confinement-deconfinement transition and a phase transition associated with the spontaneous breaking of a global symmetry that realizes the Standard Model Higgs field as a pseudo-Nambu-Goldstone boson. Based on the argument of universality, we discuss the order of the phase transition associated with the global symmetry breaking by studying the renormalization group flow of the corresponding linear sigma model at finite temperature, which is calculated by utilizing the ϵ -expansion technique at the one-loop order. Our analysis indicates that some composite Higgs models accommodate phenomenologically interesting first-order phase transitions.

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