

Dynamics of electroweak phase transitions in the singlet-extend model.

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It has been demonstrated that first-order phase transitions (PTs) are achievable in a large number of BSM models. However, the successful nucleation of PT vacuum bubbles is often overlooked. Using the singlet model as an example, we will present the possible patterns of PTs achieved and build the connection to the vacuum structure at zero temperature. In this talk we focus on the one-step PTs and discuss the PT dynamics from nucleation and percolation. We find that bubble nucleation may be unsuccessful even though first-order PTs happened, and low temperature PTs favors relatively slow PTs. Finally, we comment on the limitations of studying the physics of PTs using the mean-field approach.

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