

Electroweak Phase Transition in a Z_6 -Symmetric Model with Scalar Singlet and Fermionic Dark Matter

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We investigate the nature of the electroweak phase transition (EWPT) in a minimal Z_6 -symmetric extension of the Standard Model, featuring a fermionic dark matter candidate (ψ_L, ψ_R) and a real scalar singlet (ϕ). Selecting benchmark points that satisfy both the observed dark matter relic density and direct detection constraints, we analyze whether the EWPT is first-order in this scenario. Our study demonstrates how specific parameter choices can enhance the strength of the phase transition, providing a starting point for electroweak baryogenesis and gravitational wave signatures.

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