

Phenomenology 2023 Symposium



Contribution ID: 125

Type: not specified

Bubble profile and baryon asymmetry in the C2HDM

Monday 8 May 2023 16:30 (15 minutes)

Electroweak baryogenesis is a popular mechanism to generate baryon asymmetry at the electroweak scale. The key ingredient in the estimation of baryon asymmetry during electroweak baryogenesis is the bubble profile. In EWBG studies, it is a routine practice to parametrize the bubble profile by the kink profile using the tanh function. A more refined estimation of the bubble profile can be obtained by solving the tunnelling equation. In the talk, I will present the viability of the kink profile assumption in the framework of CP violating 2HDM. In the bulk of parameter space points, the kink profile predicts the correct order of asymmetry as obtained from the tunnelling profile. There are instances where the kink profile cannot capture the tunnelling profile, thereby showing a significant difference in the asymmetries. I will discuss a few benchmark situations illustrating these differences. I will also discuss the key factors triggering strong first-order phase transition in CP-violating 2HDM parameter space.

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Session Classification: BSM V

Track Classification: BSM