Contribution ID: **49**   Type: **not specified**

Is our vacuum global in economical 331 models?

Wednesday, September 24, 2025 2:00 PM (15 minutes)

The so called 331-models are SM extensions based on $SU(3)_c \times SU(3)_L \times U(1)_X$-gauge group. The scalar potential of 331-models is typically quite complicated, due to presence of three scalar triplets.

Although the 331 models have been extensively studied, the existence of multiple minima and metastability of the 331 scalar potential has not been studied in great detail in the literature, previous studies concentrating on overly simplified scalar potentials that are not used in phenomenology. We study the typical scalar potential of 331-model with three scalar triplets, which is often used in the phenomenological studies. We classify the potential minima and determine the conditions under which the electroweak vacuum is global with the help of orbit space methods. For the case the electroweak vacuum is not global, we calculate bounds on the scalar couplings from metastability. This talk is based on work which will be published soon.

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Session Classification: Parallel 3

Track Classification: Parallel