

Status of triplet extended Higgs sector models in the light of NLO unitarity and the latest LHC data

Wednesday, November 6, 2024 10:20 AM (20 minutes)

Minimal triplet scalar extension of the Standard Model demanding custodial symmetry gives rise to a new model, the extended Georgi-Machacek (eGM) model, not the well-known Georgi-Machacek (GM) model. In this talk, I will discuss the theoretical bounds on the model parameter space, such as next-to-leading order unitarity and state-of-the-art bounded from below conditions on the potential parameters. I will present the results of a Bayesian fit with Markov Chain Monte Carlo simulations for both GM and eGM models to these theoretical bounds together with the Run 1 and Run 2 LHC data on Higgs signal strengths, incorporating the latest CMS and ATLAS di-photon excess data for a Higgs boson around 95 GeV. I will delineate the allowed ranges for the additional Higgs boson masses and their mass differences, and the limit on the triplet vacuum expectation value in the presence of the 95 GeV scalar. Finally, I will discuss the possibility of studying new decay modes in the eGM model and present the bounds on their branching ratios from the global fit, that could potentially be observed at the LHC and at the other future colliders.

Primary track

BSM Higgs physics

Is the speaker a PhD student or post-doc?

Yes - I need some financial support (fee reduction) to attend Higgs 2024

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Session Classification: BSM Higgs physics 3 - sal IX

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