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Impact of radiative corrections on decays of Higgs bosons in extended Higgs sectors

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In various new physics models, the Higgs sector is often extended from its minimal form in the standard model (SM), and there are additional Higgs bosons.

Direct searches of the additional Higgs bosons and precision studies of the SM-like Higgs boson play complementary roles to explore the extended Higgs models.

Recently, it has turned out that the properties of the SM-like Higgs boson are consistent with the prediction in the SM under theoretical and experimental uncertainty. This leads us to investigate the approximate alignment scenario, where the couplings of the SM-like Higgs boson are close to the predictions in the SM. In this scenario, the sizes of radiative corrections are comparable with the tree-level contribution, especially in the decays of additional Higgs bosons into the SM-like Higgs boson.

In this talk, we discuss the impact of radiative corrections in decays of the CP-odd Higgs boson in the two-Higgs doublet model (2HDM). We show that radiative corrections sizably change the theoretical predictions for the decay branching ratios.

In addition, we discuss how to discriminate the four types of Yukawa interaction in 2HDM at future collider experiments by the decay patterns of additional Higgs bosons.

These calculations are implemented in the program code "H-COUP". This talk is based on NPB976 (2023) 116047 [arXiv: 2207.01032] and work in progress.

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