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New Physics Implication of Higgs Precision Measurements

In this talk, we discuss the new physics implication of Higgs Precision Measurements at the future electron-positron Higgs factories, including the Chinese proposal CEPC, the European proposal FCC-ee, as well as the Japanese proposal of ILC. We explored two typical types of new physics models: Two Higgs Double Model (2HDM) as an example of weakly coupled BSM scenarios, and composite Higgs Model as an example of strongly coupled BSM scenarios. For 2HDM, we studied both the tree level effects, mainly, the effect caused by the mixture of SM-like Higgs and Non-SM like Higgs in the 125 GeV light Higgs, as well as the loop effects, introduced by the extra Higgses running in the loop. We found that even comparing to HL-LHC with 3000 fb^{-1} luminosity, future Higgs factories could narrow the region of $\cos(\beta - \alpha)$ at least a factor of 2 smaller when considering tree level effects only. Considering the loop effects in the alignment limit, the heavy Higgs masses could be constrained to be larger than 500 GeV or better. For composite Higgs Model, we performed a 10-parameter fit to the coefficients of the effective operators. The scale Lambda for the non-renormalizable operators could be constrained to be around 5 TeV or higher.

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