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Shape of Higgs Potential at Future Colliders

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Although Higgs boson has been discovered, but its self-couplings are poorly constrained, which leaves nature of Higgs boson undetermined. Motivated from difference potential than Landau-Ginzburg type, we systematically organize various new physics scenarios, psuedo-Goldstone Higgs, Coleman-Weinberg Higgs and Tadpole-induced Higgs, etc. We find that di-Higgs production at 27 TeV HE-LHC have ability to discriminate different Higgs scenarios, while it is necessary to use three Higgs production at 100 TeV collider to fully determine shape of Higgs potential.

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