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Two-Loop

cal O$(\alpha_t + \alpha_\lambda + \alpha_\kappa)^2$ Corrections to the Higgs Boson Masses in the CP-Violating NMSSM

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The Higgs boson mass has turned into a precision observable with an uncertainty of a few hundred MeV at the LHC and provides an important constraint on the parameter space of supersymmetric models. To have sensible limits, the experimental accuracy has to be matched by the precision of the theory predictions. Consequently, a tremendous effort has been put in the computation of the higher-order corrections to supersymmetric Higgs boson masses.

In this talk, we report about our computation of the $calO\left(\alpha_t + \alpha_\lambda + \alpha_\kappa\right)^2$ two-loop corrections to the Higgs boson masses of the CP-violating Next-to-Minimal Supersymmetric Standard Model (NMSSM) using the Feynman-diagrammatic approach. We discuss the renormalization schemes used for the Higgs sector and the top/stop sector, together with the treatment of the infrared divergences which appear in the gaugeless and zero momentum approximation. We present the numerical impact of the new corrections and their dependence on the renormalization scheme and the renormalization scale. Our new corrections have been implemented in the Fortran code **NMSSMCALC** that computes the Higgs mass spectrum of the CP-conserving and CP-violating NMSSM as well as the partial decay widths of the Higgs bosons including the state-of-the-art higher-order corrections. Our results mark another step forward in the program of increasing the precision in the NMSSM Higgs boson observables.

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