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Precise predictions for Higgs-masses in the Next-to-Minimal Supersymmetric Standard Model (NMSSM)

The NMSSM represents an elegant and well motivated alternative description for the observed phenomenology in high energy physics. In this theory a scalar singlet together with its superpartner is added to the Higgs-sector of the Minimal Supersymmetric Standard Model (MSSM). In order to allow significant testing of the NMSSM by experiments precise predictions for the parameters of the theory are a necessity.

The talk will focus on the prediction for the Higgs-masses in the NMSSM at 1-loop order supplemented by the contributions at 2-loop order from the Minimal Supersymmetric Standard Model (MSSM), both obtained by diagrammatic methods. At 2-loop order the resummation of large logarithms is included. The presented approximation at the 2-loop level will be discussed in detail as well as its range of validity. The talk will also provide some insights into the basic principles of the calculation, especially the renormalisation of softly broken supersymmetric gauge theories.

additional information

The presented work will be implemented into the code FeynHiggs.

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