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

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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 up to 2-loop order obtained by diagrammatic methods. While the calculation at 1-loop order is performed in the full NMSSM, the contributions at 2-loop order are taken from the MSSM as a very good approximation. The approximation will be motivated and its validity will be discussed in detail.

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