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Interference effects of neutral Higgs bosons in the MSSM

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The interpretation of the Higgs signal within the MSSM requires precise theoretical predictions including mixing and higher-order effects. In case of nearby resonances in the Higgs sector, interference effects may be relevant. However, the interference term is neglected by the standard narrow-width approximation (NWA), which is in other respects a convenient tool for the factorisation of a more complicated process into production and subsequent decay of a particle with a small width compared to its mass.

Hence, a generalisation of the usual NWA is analysed which allows for a consistent treatment of interference effects between nearly mass-degenerate particles. This can be useful for the application to processes for which the factorisation into different sub-processes is essential to enable the computation of higher-order contributions.

Phenomenological consequences of interference effects between neutral MSSM Higgs bosons will be presented for an example process of Higgs boson production and its subsequent decay including one-loop corrections. To validate the generalised NWA, the factorised version will be compared to the calculation of the complete process at the one-loop level. Furthermore, full Higgs propagator mixing will be examined in comparison to the Breit-Wigner approximation.

Summary

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