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Determination of the Higgs CP mixing angle in the tau decay channels

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We investigate the measurement of the CP mixing angle of the 126 GeV neutral spin-0 Higgs boson in its tau decay channels. The tau decay channel of the Higgs boson has the particular advantage that possible CP-violating contributions alter the Higgs-tau-tau coupling already at the leading order. Within our proposed method the di-lepton, lepton-hadron as well as the hadron-hadron channel of the tau decay can be included in the measurement. We discuss the prospect of the precision on the CP mixing angle measured at the LHC and compare with the expected sensitivity at the LC. We furthermore derive the distributions of the major background - the contribution due to virtual Z and photon exchange.

Summary

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