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Probing CPV mixing in the Higgs sector in VBF at 1 TeV ILC

Friday 19 July 2024 15:38 (17 minutes)

With the current precision of measurements by ATLAS and CMS experiments, it cannot be excluded that a SM-like Higgs boson is a CP violating mixture of CP-even and CP-odd states. We explore this possibility here, assuming Higgs boson production in ZZ-fusion, at 1 TeV ILC, with unpolarized beams. The full reconstruction of SM background and fast reconstruction of the signal is performed, simulating 8 ab^{-1} of data collected with the ILD detector. We demonstrate that the CP mixing angle $\Psi_{\rm CP}$ between scalar and pseudoscalar states can be measured with the statistical uncertainty of 4 mrad at 68% CL, corresponding to $1.6 \cdot 10^{-5}$ for the CP parameter f_{CP}. This is the first result on sensitivity of an e^+e^- collider to measure f_{CP} in vector boson fusion.

Alternate track

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Yes

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