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Isolating systematic effects with beam polarisation at e^+e^- colliders

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Future high-energy e^+e^- colliders will provide some of the most precise tests of the Standard Model. Statistical uncertainties are expected to improve by orders of magnitude over current measurements.

This provides a new challenge in accurately assessing and minimizing systematic uncertainties. Beam polarisation may hold a unique potential to isolate and determine the size of systematic effects.

So far, studies have mainly focused on the statistical improvements from beam polarisation. This study aims to assess the impact on systematic uncertainties.

A combined fit of precision observables, such as cross-sections, asymmetries and anomalous gauge couplings, together with systematic effects is performed on 2-fermion and 4-fermion final-states. Different setups of available beam polarisations and luminosities are tested with and without systematic effects.

The dependence of the uncertainties and correlations for the varying setups informs the relevance of beam polarisation for isolating systematic effects.

Effects observed for this analysis may qualitatively apply to other analyses as well. Future collider efforts can use this knowledge in their design studies to maximize their physics potential.

Time Zone

Europe/Africa/Middle East

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