

# Probing Gauge-Higgs Unification models at the ILC with quark-antiquark forward-backward asymmetry at center-of-mass energies above the $Z$ mass (12+3)

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The International Linear Collider (ILC) will allow the precise study of  $e^+e^- \rightarrow q\bar{q}$  interactions at different center-of-mass energies from the  $Z$ -pole to 1 TeV.

In this paper, we discuss the experimental prospects for measuring differential observables in  $e^+e^- \rightarrow b\bar{b}$  and  $e^+e^- \rightarrow c\bar{c}$  at the ILC baseline energies, 250 and 500 GeV.

The study is based on full simulation and reconstruction of the International Large Detector (ILD) concept. Two gauge-Higgs unification models predicting new high-mass resonances beyond the Standard Model are discussed.

These models predict sizable deviations of the forward-backward observables at the ILC running above the  $Z$  mass and with longitudinally polarized electron and positron beams.

The ability of the ILC to probe these models via high-precision measurements of the forward-backward asymmetry is discussed.

Alternative scenarios at other energies and beam polarization schemes are also discussed, extrapolating the estimated uncertainties from the two baseline scenarios.

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