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Fermion pair production at e^-e^+ linear collider experiments in GUT inspired gauge-Higgs unification

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In gauge-Higgs unification (GHU), the 4D Higgs boson appears as a part of the fifth dimensional component of 5D gauge field. Recently, an $SO(11)$ GUT inspired $SO(5) \times U(1) \times SU(3)$ GHU model has been proposed. In the GHU, Kaluza-Klein (KK) excited states of neutral vector bosons, photon, Z boson and Z_R boson, appear as neutral massive vector bosons Z' 's. The Z' bosons in the GHU couple to quarks and leptons with large parity violation, which leads to distinctive polarization dependence in, e.g., cross sections and forward-backward asymmetries in $e^-e^+ \rightarrow \mu^-\mu^+, q\bar{q}$ processes.

In the talk, we discuss fermion pair production in e^-e^+ linear collider experiments with polarized e^- and e^+ beams in the GUT inspired GHU. Deviations from the SM are shown in the early stage of ILC 250 GeV experiments. The deviations can be tested for the KK mass scale up to about 15 TeV.

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