Constraining anomalous gauge boson couplings in $e^+e^- \rightarrow W^+W^-$ using polarization asymmetries with polarized beams

RAFIQUL RAHAMAN$^1$, RITESH K. SINGH$^2$, IISER Kolkata — We study the anomalous $W^+W^-V$ ($V = \gamma, Z$) couplings in $e^+e^- \rightarrow W^+W^-$ using the complete set of polarization observables of $W$ boson with longitudinally polarized beams. We use most general Lorentz invariant form factors parametrization as well as $SU(2) \times U(1)$ invariant dimension 6 effective operators for the effective $W^+W^-V$ couplings. We estimate simultaneous limits on the anomalous couplings in both the parametrization using cross section, forward backward asymmetry and polarization observables of $W$ boson with different kinematical cuts using Markov-Chain-Monte-Carlo (MCMC) method for an $e^+e^-$ collider running at centre of mass energy of $\sqrt{s} = 500$ GeV and $\mathcal{L} = 100$ fb$^{-1}$. The best limits on form factors are obtained to be $1 \sim 5 \times 10^{-2}$ for $e^-$ and $e^+$ polarization being $(+0.4, -0.4)$. For operator’s coefficients, the best limits are obtained to be $1 \sim 16$ TeV$^{-2}$.

$^1$MOHANPUR-741246, WB, INDIA
$^2$MOHANPUR-741246, WB, INDIA