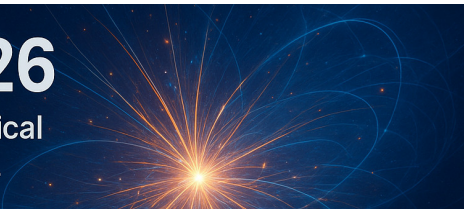


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Decay of Z boson to a pair of tau leptons at the LHC: spin effects and New Physics

Wednesday, January 14, 2026 11:30 AM (30 minutes)

Possible anomalous New Physics contributions to dipole and weak dipole moments of the tau lepton bring renewed interest in development and revisiting charge-parity violating signatures in the tau-pair production in Z-boson decay at energies of the Large Hadron Collider.

Effects of anomalous contributions on polarization and spin correlations of the tau leptons, in the production process $q \bar{q} \rightarrow \tau^- \tau^+$ with the tau decays included, will be discussed.

Because of the complex nature of the resulting distributions, Monte Carlo techniques are useful. Extensions of the Standard Model with electroweak radiative corrections and anomalous dipole moments are implemented in the Monte Carlo TauSpinner program. In addition, this implementation allows one to introduce arbitrary phase-shift between

vector and axial-vector couplings of Z boson to tau leptons, which can have impact on observed transverse spin correlations.

Examples of the impact on experimental signatures will be presented in case of the tau-decay channels: $\tau^- \rightarrow \rho^- \nu_\tau$ and $\tau^+ \rightarrow \rho^+ \nu_\tau$.

Author: KORCHIN, Alexander (NSC Kharkiv Institute of Physics and Technology, Kharkiv, Ukraine)

Presenter: KORCHIN, Alexander (NSC Kharkiv Institute of Physics and Technology, Kharkiv, Ukraine)

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