MODEL-INDEPENDENT ESTIMATE OF PARAMETERS WITHIN DATA ON THE FORWARD-BACKWARD ASYMMETRY FOR DRELL-YAN PROCESS AS 7 TEV

A. Pevzner, V. Skalozub
Oles Honchar Dnipropetrovsk National University, Ukraine
E-mail: apevzner@omp.dp.ua

The Abelian Z' gauge boson properties are investigated by applying the model-independent approach to the Drell–Yan process data at the LHC at $\sqrt{s} = 7$ TeV published by the CMS Collaboration. It is expected that the Z' boson manifests itself as an intermediate state as well as the photon and the Z boson in this process. The forward-backward asymmetry is chosen as an observable. The Z' axial-vector coupling a_f^2 to the Standard model fermions, which is universal, and the couplings of axial-vector to lepton vector currents $a_f v_l$ are derived at 68 % CL. It is figured out that the mentioned couplings almost do not depend on the $m_{Z'}$ in the investigated interval $m_{Z'} > 1.2$ TeV. The Z-Z' mixing angle θ_0 is also estimated. Taking into account its dependence on the Z' mass and the result $|\theta_0| \sim 10^{-3}$ from the LEP experiments, the limits on $m_{Z'}$ are established as 3 TeV $< m_{Z'} <$ 10 TeV at 68 % CL. The analysis is based on the behavior of the differential cross-section which exhibits itself if the special relations between the couplings proper to the renormalizable theories are accounted for. All estimates are performed in terms of the maximum likelihood method. It is shown that the results are in agreement with the previous ones obtained from the LEP and Tevatron data. Comparison with the results of other authors is given.