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## Study of the $p_T$ spectrum of the $Z$ boson at LHC using leading-order event generators

Monday 12 December 2022 14:00 (1 hour)

The measurement of the production cross section and transverse momentum ( $p_T$ ) spectrum of  $Z$  boson at the LHC provides first tests of the Standard Model (SM). This measurement could be sensitive to exotic physics processes in new energy regime. The  $Z$  boson production is also a common background process for many other physics analyses and therefore it must be well understood. In this contribution, we will present a study of  $Z$  boson production in association with jets with p-p collisions at a center-of-mass energy of 13.6 TeV at LHC, using leading-order event generators such as PYTHIA and HERWIG. The  $Z$  boson has been reconstructed in  $\mu^+\mu^-$  and  $e^+e^-$  decay channels using different kinematic selections. These selection criteria involve each of the leptons having transverse momentum ( $p_T > 20$  GeV) and within the central region ( $|\eta| < 2.4$ ) of the detector. The jets (anti- $k_T$ ) produced are constrained within cone size of  $r = 0.4$ , having transverse momentum ( $p_T$ ) of jets greater than 30 GeV and  $|\eta| < 1.3$ . A comparison of  $Z_{p_T}$  spectrum with both the generators will be presented.

### Session

Top Quark and EW Physics

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