Contribution ID: **58** Type: **not specified**

Differential measurement of the Z/γ ratio with the CMS experiment in pp collisions at 13 TeV

Tuesday 9 April 2019 11:15 (15 minutes)

The large amount of data collected at the Large Hadron Collider in its second phase of running, colliding protons at an unprecedented center of mass energy of 13 TeV, gives us the tremendous opportunity to conduct measurements of vector boson plus jets (V+jets) processes in regions of phase space that were previously limited.
This kind of processes play a key role in precision tests of the Standard Model and also the search for a wide variety of phenomena beyond the Standard Model. They are valuable probes of perturbative QCD and validate fundamental aspects of theoretical calculations, also providing crucial inputs in the determination of Parton Distribution Functions. Moreover, thanks to the high center of mass energy, V+jets processes are sensitive to effects from higher order electroweak (EWK) corrections.
In parallel, developments in theoretical calculations have led to improved predictions and state of the art event generators becoming available, with the near term prospect of having automated Next-to-Leading-Order QCD and EWK corrections.The availability of such predictions, together with the large amount of data, add interest in studying particular phase space corners where EWK corrections are enhanced, such as collinear vector boson emission from a jet, and ratio of V+jets production cross sections, characterized by small systematic uncertainty on the measurement.
In my talk, I will present a precision measurement of the differential cross-sections of Z+jets and photon+jets production as a function of the boson transverse momentum and their ratio. The data was taken during 2016 by the CMS experiment and corresponds to an integrated luminosity of 35.9 fb−1, and are compared with several theoretical predictions.

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Session Classification: Parallel stream 2