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Study of Z boson production in pp, pPb and PbPb collisions in CMS

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The Z boson is a new probe of ultra-relativistic heavy-ion collisions, which became accessible at the LHC energies. Unambiguously detected when decaying in the dilepton channel, it can help to constrain nuclear parton distribution functions, it can serve as a standard candle for initial state effects, and it represents an in-situ probe for binary scaling in the final state of the collisions. We will report on the Z boson measurements with the CMS detector, using pp and pPb data recorded in 2013, and PbPb data recorded in 2011. The transverse momentum and rapidity differential cross sections of Z bosons measured in both pp and PbPb collisions at 2.76 TeV, as well as in pPb collisions at 5.02 TeV will be presented. This provides access to the low Bjorken x region, which is lacking precision experimental measurements needed by nuclear PDF parametrizations. Nuclear modification factors as a function of transverse momentum, rapidity and centrality for PbPb collisions will be shown, together with forward-backward ratios for pPb collisions.

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