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Z boson production in Pb–Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV

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To compute cross sections in proton-proton collisions, parton distribution functions (PDFs) are used which describe the density of partons within the proton. In nuclear environments, such as heavy ions, these densities change and therefore PDFs must be modified to nuclear PDFs (nPDFs). Measurements of electroweak bosons help to constrain the nPDFs. This in turn allows to compute cross sections in heavy-ion collisions with higher precision.

In this poster the Z-boson production is reported in Pb–Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV. The measurement is done through the muonic decay channel. The normalized invariant yield is measured for dimuons with mass $60 < m_{\mu\mu} < 120$ GeV/ c^2 and rapidity $2.5 < y < 4$. It is presented as a function of rapidity as well as collision centrality. The results are compared to different theoretical predictions of the parton distribution functions (both PDF and nPDF). A 3.4σ deviation is seen in the integrated yield between the data and the free PDFs (no nuclear modifications), while they are in agreement with the nPDF predictions. The differential data will serve as constraints for the nPDFs.

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