

TUJU21: Nuclear PDFs with electroweak-boson data at NNLO

Tuesday 3 May 2022 15:40 (20 minutes)

Nuclear parton distribution functions (nPDFs) quantify the initial-state nuclear effects and provide a factorization-based input for perturbative calculations in nuclear collisions. These distributions can be determined in a global QCD analysis using wide range of experimental data. In addition to older fixed-target deep inelastic scattering and Drell-Yan dilepton production data, several analyses from p+Pb collisions at the LHC provide further constraints and extend the kinematic reach of applicable data. Here we present an update of our previous TUJU19 analysis where we now include also electroweak-boson production data recently measured by ATLAS and CMS. For the first time, LHC data are included in a nPDF analysis performed at next-to-next-to-leading (NNLO) order in perturbative QCD. As before, our setup is based on the open-source analysis framework xFitter and we fit our own proton baseline ensuring fully consistent setup. We find a good agreement with the applied data and that the resulting χ^2/N_{df} is significantly smaller in case of NNLO analysis (0.84) compared to our NLO analysis (0.94). We compare our results to other published nPDF fits and find a reasonable agreement given the large uncertainties especially for the flavour dependence. Also, we present comparisons between our NNLO calculations and electroweak-boson production data in Pb+Pb collisions from ATLAS and CMS.

Submitted on behalf of a Collaboration?

No

Authors: Dr HELENIUS, Ilkka (University of Jyväskylä); WALT, Marina (Universität Tübingen); VOGELSANG, Werner (Science and Technology Facilities Council STFC (GB))

Presenter: Dr HELENIUS, Ilkka (University of Jyväskylä)

Session Classification: WG1: Structure Functions and Parton Densities

Track Classification: WG1: Structure Functions and Parton Densities