Contribution ID: **352** Type: **Parallel**

Investigation of parton densities at very high x

Thursday 5 July 2018 11:45 (15 minutes)

The knowledge of the proton parton densities for large x is very important in the search for new physics signals at the LHC. For Bjorken-x larger than 0.6 they are however poorly constrained by the data used in extracting the proton parton density functions (PDFs) and different pdf sets have large uncertainties, and differ considerably, in this regime. We compare the pdf sets most widely used by the LHC community to the ZEUS high-x data. This data has not been previously used in pdf set determinations. Due to the small expected and observed numbers of events in this kinematic regime, Poisson statistics is used in the evaluation of the probabilities assigned to the different pdf sets. A wide variation is found in the ability of the PDF sets to predict the observed results.

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Session Classification: Strong Interactions and Hadron Physics

Track Classification: Strong Interactions and Hadron Physics