Parton distributions for the LHC precision era

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摘要：

The parton distribution functions (PDFs), defined the probability densities for finding a parton (quark or gluon) within a nucleon, are essential for the current and future hadron colliders, such as LHC and FCC-hh/SppC. In modern times, PDFs are extracted with a global analysis of hadronic data, including deep inelastic scattering (DIS), fixed-target and collider experiments. In this talk, I will first review the latest prgress of the global analyses of PDFs and its applications for the ongoing LHC Run III as well as the future HL-LHC. Meanwhile, with the accumulation of the LHC data and a lack of direct signals for new physics, we are have entered its precision era. The PDF uncertainty, nowadays, becomes a bottleneck for us to understand many precision measurements, such as the latest MW anomaly at CDF-II. I will discuss the challenges to fit the LHC precision data as well as potential solutions towards the future

报告人简介：

Keping Xie is a postdoc at Michigan State University. Before that, he did his first postdoc at the University of Pittsburgh. He obtained his Ph. D. at Southern Methodist University in 2019 and Bachelor's degree at Peking University in 2014. He mainly works on parton distributions functions. As a member of the CTEQ-TEA (CT) collaboration, he was one of the major contributors to the latest CT18 PDFs. He led the QED corrections to the CT18 PDFs, i.e., CT18QED. Recently, he is dedicated to the electroweak (EW) factorizaiton, involving functions/parton shower for final-state ones. His work also covers high-orer calculations, heavy flavors, neutrinos, Higss bosons beyond the Standard Model, and effective field theory.