Recent results from STAR for parton distribution functions at low and high x in proton-proton collisions

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Jets, clusters of collimated particles produced in high energy proton-proton (pp) collisions, serve as a useful channel for studying the internal structure of the proton. According to perturbative quantum chromodynamic (pQCD) calculations, at center-of-mass energies of $\sqrt{s} = 200$ and 510 GeV, jet production at mid-pseudorapidity, $|\eta| < 1$, is dominated by quark-gluon and gluon-gluon scattering processes. Therefore these jets are direct probes of the gluon parton distribution functions (PDFs) with momentum fraction $0.01 < x < 0.5$. Moreover the $W^{+/-}$ boson cross-sections and their ratio, W^+/W^-, at $\sqrt{s} = 510$ GeV are effective tools to explore quark and anti-quark PDFs. In particular, the W^+/W^- cross-section ratio is sensitive to $\bar{d}/\bar{u}$. In this talk, we will present the recent STAR results of mid-pseudorapidity inclusive jet cross-sections at $\sqrt{s} = 200$ and 510 GeV, and the W boson cross-sections and their ratio at $\sqrt{s} = 510$ GeV, from pp collisions. The theoretical implications of these results will also be discussed.