Measurements of W^+ and W^- cross sections and their ratio in pp collisions at STAR

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While the unpolarized valence quark (d and u) distributions are well determined from DIS and $pp/p\bar{p}$ experiments, their sea (anti-)quark counterparts, $\bar{d}$ and $\bar{u}$, are much less constrained, in particular, near the valence region (momentum fraction, $x \sim 0.2$). Measurements of W^+ and W^- production in pp collider experiments can be used to probe the $\bar{d}$ and $\bar{u}$ at a large Q^2 set by the W mass. Presented in this talk are the latest updates of W^+ and W^- cross sections and their ratio using the STAR pp collision data at a center-of-mass energy of $\sqrt{s} = 510\,\mathrm{GeV}$ collected in 2017, corresponding to an integrated luminosity of $350\,\mathrm{pb}^{-1}$. The measurements were performed by tagging leptons from the weak decay channel ($W \to e\nu$) arising from the mid ($|\eta| < 1$) and intermediate rapidities ($1 < \eta < 1.5$), probing the $\bar{d}$ and $\bar{u}$ within the proton momentum fraction range of $0.06 < x < 0.4$. This measurement will improve the precision of the previous measurement performed with the STAR 2011, 2012, and 2013 data. A projection for the STAR 2022 data will be presented.