

The cross section of W+charm is measured in 13 TeV pp-collisions in the CMS experiment. In this analysis W bosons are reconstructed by their decays into a muon and a neutrino. The c quarks are tagged by the full reconstruction of $D^{*(2010)\pm}$. This measurement is used to estimate an impact on the strange-quark distribution of the proton.

Measurement of W+charm Cross Section

- CMS 2016 data ($\mathcal{L} = 35.7 \text{ fb}^{-1}$)
- $W \rightarrow \mu\nu$
 - $p_T^\mu > 26 \text{ GeV}, |\eta^\mu| < 2.4$
 - $M_T > 50 \text{ GeV}$
- $c \rightarrow D^{*\pm} \rightarrow D^0 + \pi_{slow}^\mp$
 - $p_{T,reco}^{D^*} > 5 \text{ GeV}$
 - $p_{T,gen}^c > 5 \text{ GeV}$

QCD Analysis (xFitter ver. 2.0.0)

- **HERA I+II** [Eur.Phys.J. C75 (2015) no.12, 580]
- **W asymmetry**
 - 7 TeV [Phys. Rev. D 90, 032004]
 - 8 TeV [Eur.Phys.J. C76 (2016) 469]
- **W+charm**
 - 7 TeV [JHEP 02 (2014) 013]
 - **13 TeV [CMS-PAS-SMP-17-014]**

PDF parametrization at the starting scale $Q^2 = 1.9 \text{ GeV}^2$:

$$xu_v(x) = A_{u_v} x^{B_{u_v}} (1-x)^{C_{u_v}} (1 + E_{u_v} x^2)$$

$$xd_v(x) = A_{d_v} x^{B_{d_v}} (1-x)^{C_{d_v}}$$

$$x\bar{U}(x) = A_{\bar{U}} x^{B_{\bar{U}}} (1-x)^{C_{\bar{U}}} (1 + E_{\bar{U}} x^2)$$

$$x\bar{d}(x) = A_{\bar{d}} x^{B_{\bar{d}}} (1-x)^{C_{\bar{d}}}$$

$$x\bar{s}(x) = A_{\bar{s}} x^{B_{\bar{s}}} (1-x)^{C_{\bar{s}}}$$

$$xg(x) = A_g x^{B_g} (1-x)^{C_g} (1 + D_g x)$$

$f_s = \bar{s}/(\bar{d} + \bar{s})$ released; $B_{\bar{u}} \neq B_{\bar{d}} \neq B_{\bar{s}}$

Comparison with Fixed Order QCD

- $W + c$ available at NLO in MCFM
- $\mu_r = \mu_f = M_W$
- $\frac{1}{2}\mu < \mu_r = \mu_f < 2\mu$

Comparisons with other PDFs

- Compatible with results from ν -scattering
- No observation of enhanced strangeness