Next-to-Leading Order QCD Corrections to Inclusive Heavy-Flavor Production in Polarized Deep-Inelastic Scattering

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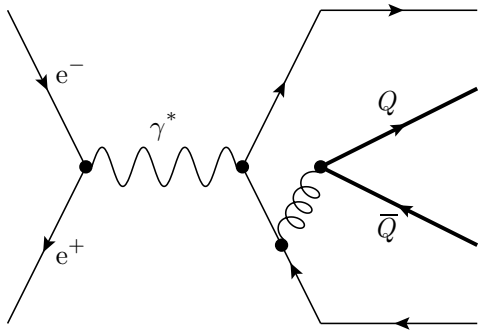
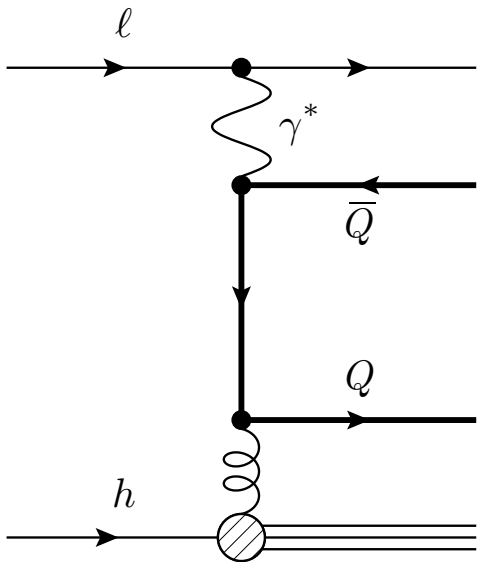
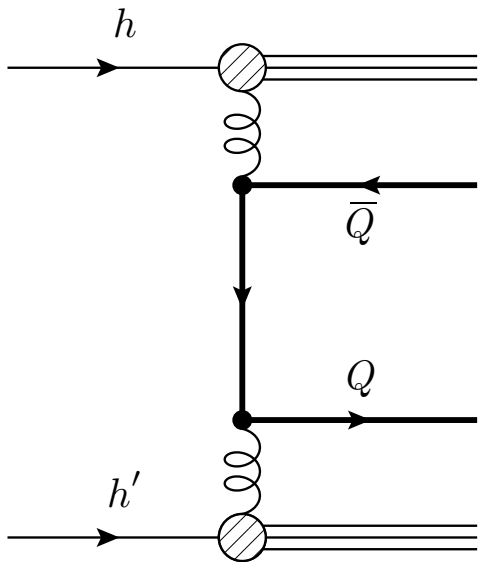
Outline

Introduction - Heavy Quarks

HQ are good

Introduction - Experimental Setups

e^--e^+-annihilation (SIA)	deep inelastic scattering (DIS)	Drell-Yan process (DY)
$e^- + e^+ \to \bar{Q} + X[Q]$	$\ell + h \to \bar{Q} + X[Q]$	$h + h' \to \bar{Q} + X[Q]$
		
LEP, ILC	HERA, COMPASS, EIC	Tevatron, LHC
gluon	factorization	top, Higgs

Introduction - Structure Functions

$$\frac{d^2\sigma}{dxdy} = \frac{2\pi y\alpha^2}{Q^4} L^{\mu\nu} W_{\mu\nu} \tag{1}$$

hard. tensor:
$$W_{\mu\nu} = \left(-g_{\mu\nu} + \frac{q_\mu q_\nu}{q^2}\right) F_1(x, Q^2) + \frac{P_\mu P_\nu}{P \cdot q} F_2(x, Q^2)$$

$$+ i\epsilon_{\mu\nu\alpha\beta} \frac{q^\alpha S^\beta}{P \cdot q} g_1(x, Q^2) \tag{2}$$

$$F_L(x, Q^2) = F_2(x, Q^2) - 2xF_1(x, Q^2) \tag{3}$$

unpol. cs:
$$\frac{d^2\sigma}{dxdy} = \frac{2\pi\alpha^2}{xyQ^2} \left(Y_+ F_2(x, Q^2) - y^2 F_L(x, Q^2)\right) \tag{4}$$

pol. cs:
$$\frac{d^2\Delta\sigma}{dxdy} = \frac{4\pi\alpha^2}{xyQ^2} Y_- \cdot 2xg_1(x, Q^2) \tag{5}$$

$$Y_\pm = 1 \pm (1 - y)^2 \tag{6}$$

Computation Review

NLO-V, NLO-S, NLO-C, NLOq

Partonic Results

cg, cq, dq

Hadronic Results

ALL g1

Outlook

fully diff, NC, NC fully diff