1 Structure of the observable

In this document we report the relevant formulas for the computation of semi-inclusive deep-inelastic scattering (SIDIS) multiplicities under the assumption that the (negative) virtuality of the Q^2 of the exchanged vector boson is much smaller than the Z mass. This allows us to neglect weak contributions and write the multiplicity as:

$$\frac{d\sigma}{dxdQ^2dzdp_T} = \frac{2p_T\pi\alpha^2}{z^2xQ^4}\left[1+(1-y)^2\right]H(Q,\mu)\sum_q e_q^2\int_0^\infty db\,bJ_0\left(\frac{bp_T}{z}\right)\overline{F}_q(x,b;\mu,\zeta)\overline{D}_q(z,b;\mu,\zeta)\,, \tag{1.1}$$

where:

$$\overline{F}_i(x,b;\mu,\zeta) = xF_i(x,b;\mu,\zeta) = R_q(\mu_0,\zeta_0\to\mu,\zeta;b)\sum_j\int_x^1 dy\,\mathcal{C}_{ij}(y;\mu_0,\zeta_0)\left[\frac{x}{y}f_j\left(\frac{x}{y},\mu_0\right)\right]\,, \tag{1.2}$$

and:

$$\overline{D}_i(z,b;\mu,\zeta) = z^3D_i(z,b;\mu,\zeta) = R_q(\mu_0,\zeta_0\to\mu,\zeta;b)\sum_j\int_z^1 dy\,\left[y^2\mathbb{C}_{ij}(y;\mu_0,\zeta_0)\right]\left[\frac{z}{y}d_j\left(\frac{z}{y},\mu_0\right)\right]\,. \tag{1.3}$$

References