Group meeting

2025.01.17

Uehara's reply

I recommend you that you add some mention for "radiative correction (for further external photon radiation)" in BN, citing your references' essence, because in many case its contribution is anticipated as more than 1%, up to a few %, in naive considerations.

$$F(x,s) = x^{\beta-1}\beta\cdot(1+\delta') - \beta(1-\frac{1}{2}x) + \frac{1}{8}\beta^2\left[4(2-x)\ln\frac{1}{x} - \frac{(1+3(1-x)^2)}{x}\ln(1-x) - 6 + x\right], \quad (3)$$

with

$$\delta' = \frac{\alpha}{\pi}(\frac{\pi^2}{3} - \frac{1}{2}) + \frac{3}{4}\beta + \beta^2(\frac{9}{32} - \frac{\pi^2}{12}), \quad (4)$$

and

$$\beta = \frac{2\alpha}{\pi}\left(\ln\frac{s}{m_e^2} - 1\right). \quad (5)$$

Here the conversion of soft photons into real e^+e^- pairs is included.

Invisible Events with Radiative Photons at LEP

Concerning higher-order QED corrections, a formulation based on structure function convolution of the exact photon spectrum is presented, which can be estimated to be accurate at the 1% level and agrees with the approximate approach of Ref. [5] within about 1%. This is implemented in a Monte Carlo event generator [13], which also can be easily generalized to describe single-photon radiative processes accompanying invisible events at LEP.