Radiative Corrections to Møller scattering

"Lowest order QED radiative corrections to longitudinally polarized Møller scattering" A. Ilyichev, V. Zykunov Phys. Rev. D 72, 033018 (2005)
This code is avaible at www.hep.by/RC
After cancelation of the infrared divergensy radiative corrected cross section of Møller scatering

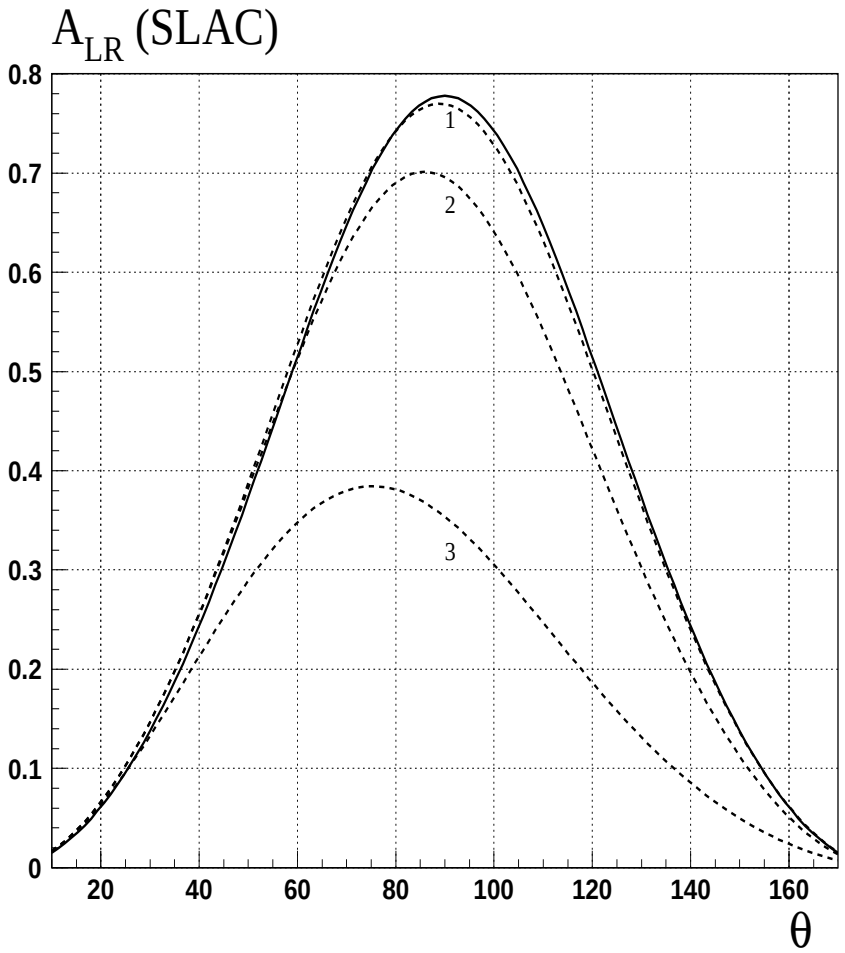
$$e(k_1) + e(p_1) \to e(k_2) + e(p_2)$$

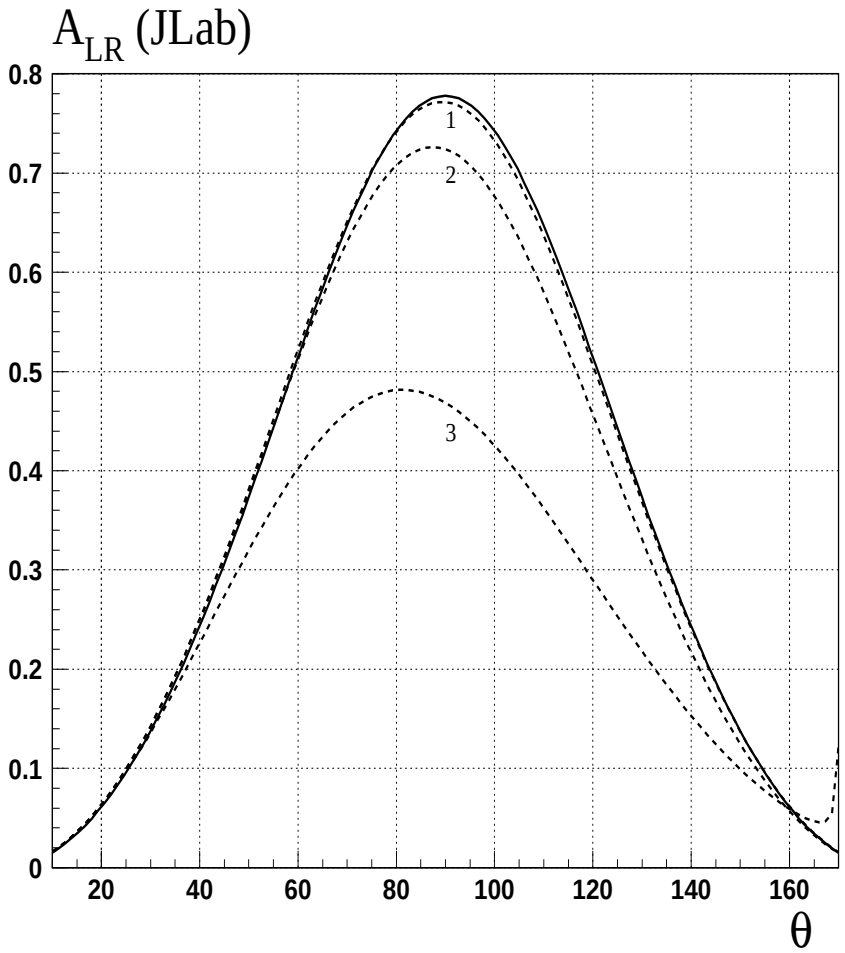
reads:

$$\frac{d\sigma^{obs}}{d\cos\theta} = \frac{d\sigma^{born}}{d\cos\theta} + \frac{d\sigma^{RC}}{d\cos\theta}(v_{cut}) .$$

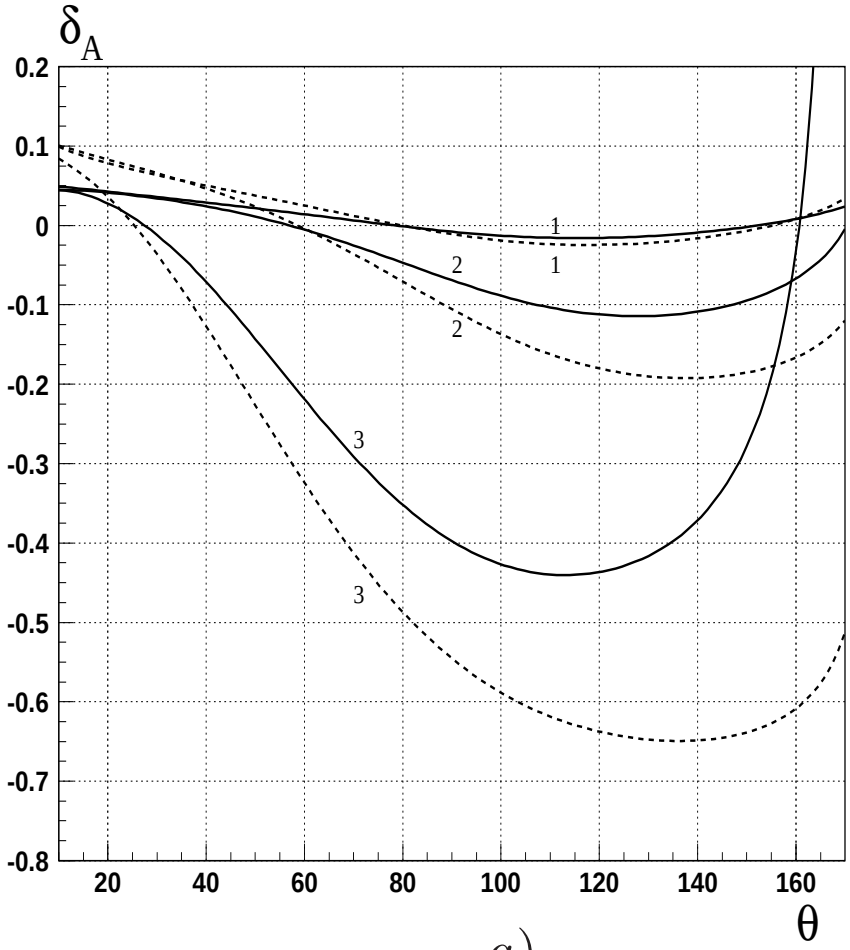
Here $v = \Lambda^2 - m^2$, $\Lambda = p_1 + k_1 - k_2$, Λ^2 is missing mass squared and $v_{cut} << v_{max}$ where

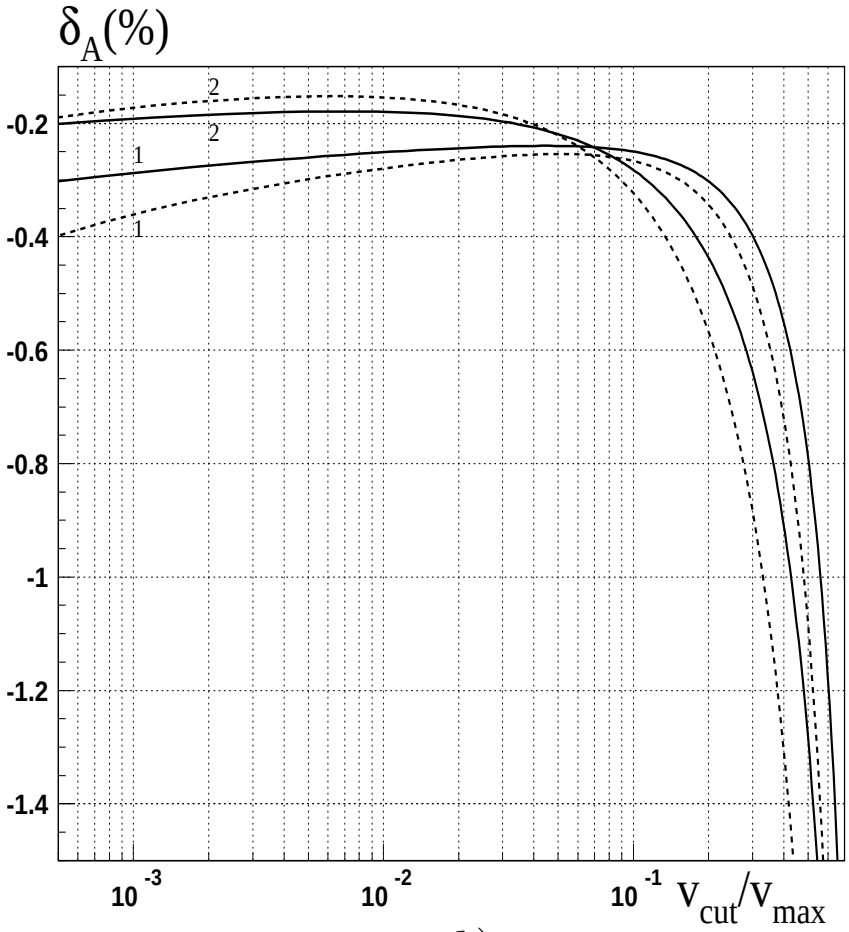
$$v_{max} = \frac{st + \sqrt{s(s-4m^2)t(t-4m^2)}}{2m^2} \sim s + t, \ (s = (k_1 + p_1)^2, \ t = (k_1 - k_2)^2)$$





θ-dependence of the Born (solid line) and observable (dashed lines) asymmetries for JLab ($E_{beam} = 1$ GeV) and SLAC ($E_{beam} = 45$ GeV) kinematic conditions with different inelasticity cuts: 1) $v_{cut} = 0.5 v_{max}$; 2) $0.9 v_{max}$; 3) $0.99 v_{max}$.





$a)$ $\delta_A = (A_{LR}^{obs} - A_{LR}^{born})/A_{LR}^{born}$ $b)$

a) δ_A as a functions of the scattering angle for JLab ($E_{beam} = 1$ GeV, solid lines) and SLAC ($E_{beam} = 45$ GeV, dashed lines) kinematic conditions with different inelasticity cuts: 1) $v_{cut} = 0.5v_{max}$; 2) $0.9v_{max}$; 3) $0.99v_{max}$.

b) δ_A as a functions of v_{cut}/v_{max} at the scattering angle in CM system 1) $\theta = 90^0$; 2) 100^0 for JLab ($E_{beam} = 1$ GeV, solid lines) and SLAC ($E_{beam} = 45$ GeV, dashed lines) kinematic conditions.