Hadron Pair Production in Collision of virtual Photons

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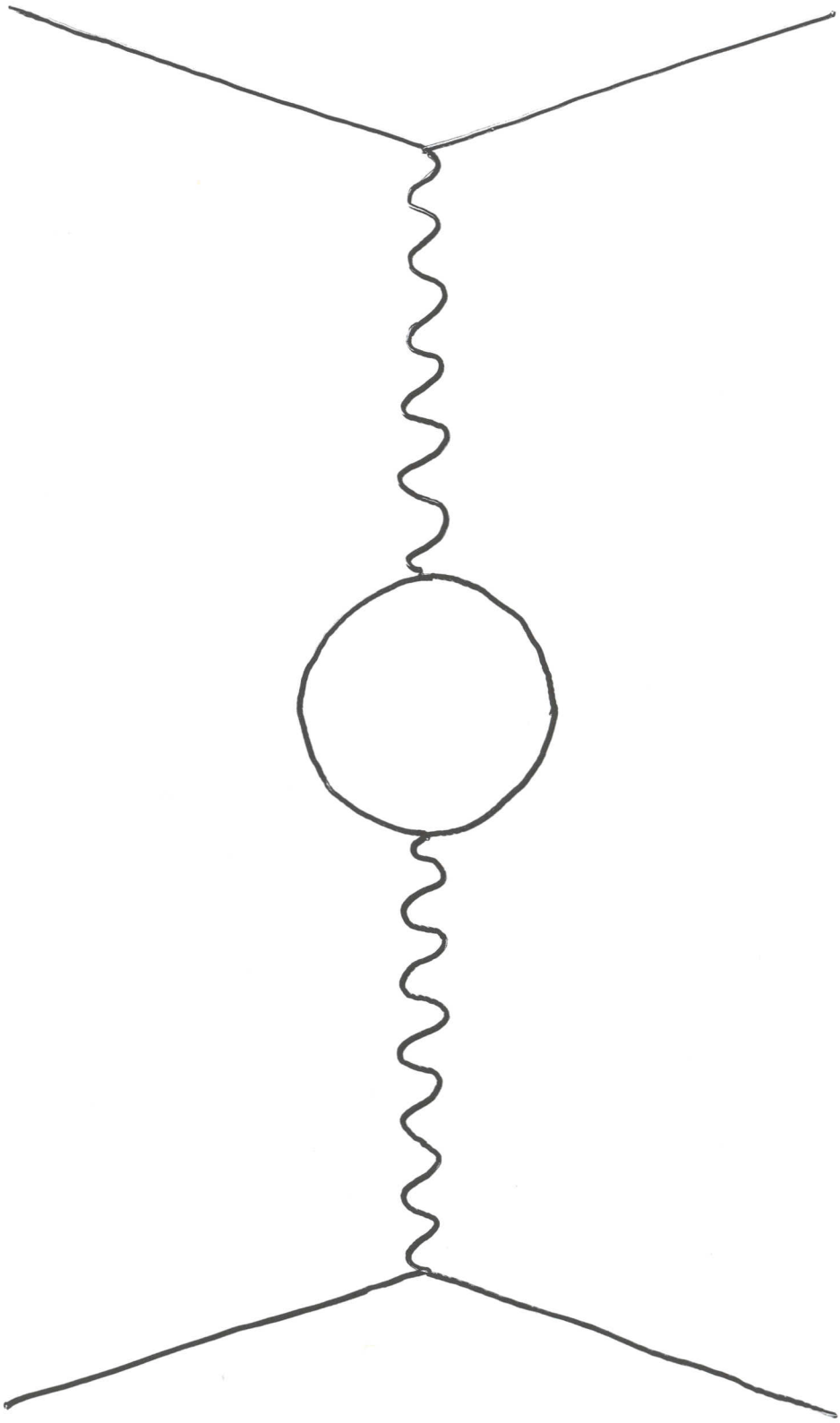
Out line

Element

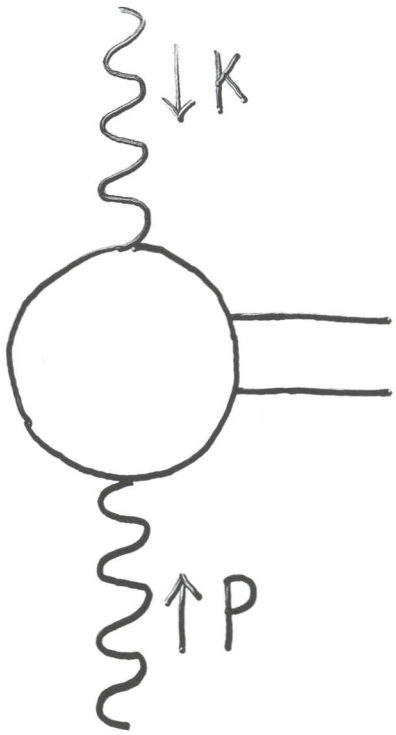
Frame

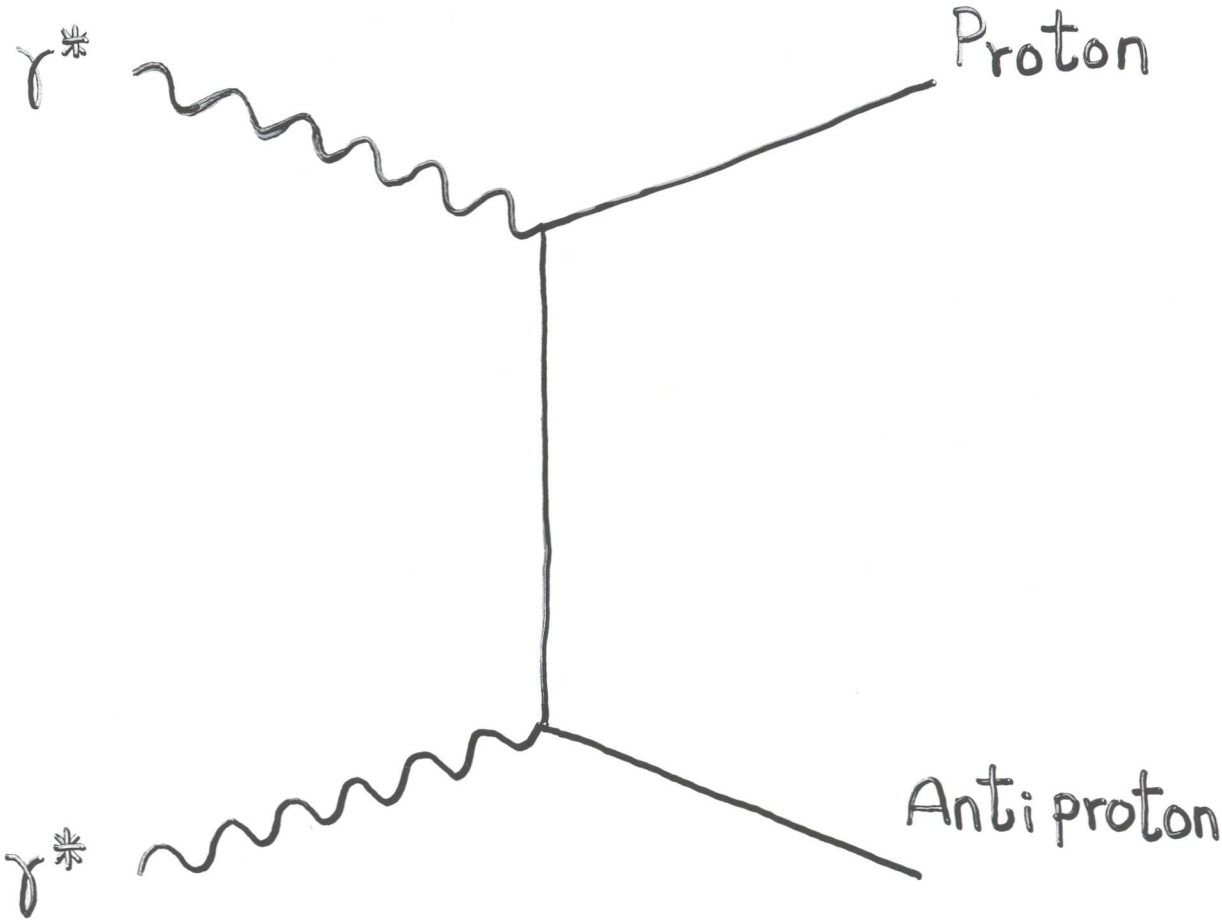
Model



$$\frac{1+\varepsilon_K \cos 2\phi_K}{1-\varepsilon_K}\,\frac{1+\varepsilon_P \cos 2\phi_P}{1-\varepsilon_P} \equiv C_{(\varepsilon,\phi)_{K,P}}$$

$$\varepsilon_K = \frac{1}{1-2\frac{\vec{K}^2}{K^2}\tan^2\frac{\theta_K}{2}} \qquad \varepsilon_P = \frac{1}{1-2\frac{\vec{P}^2}{P^2}\tan^2\frac{\theta_P}{2}}$$


K
P


γ*
Proton
γ*
Anti proton

$$d\sigma \sim C(\varepsilon,\phi)_{K,P}\,\frac{2e^4}{(-K^2)(-P^2)}$$

$$\times\Bigg(\frac{1}{(t-m^2)^2}\Big\{(U-K^2-m^2)(t-K^2-m^2)-2m^2(U-K^2-m^2)\;-2m^2(s-2m^2)$$
$$-4m^2(t-K^2-m^2)\;-8m^4\qquad\qquad -K^2(s+6m^2)\Big\}$$

$$+\frac{1}{(U-m^2)^2}\Big\{(t-P^2-m^2)(U-P^2-m^2)-2m^2(t-P^2-m^2)\;-2m^2(s-2m^2)$$
$$-4m^2(U-P^2-m^2)\;-8m^4\qquad\qquad -P^2(s+6m^2)\Big\}$$

$$+\frac{2}{(U-m^2)(t-m^2)}\Big\{m^2(s-K^2-P^2-2m^2)-2m^4+s(K^2+P^2)\Big\}\Bigg)$$

$$d\sigma \xrightarrow[m^2 \to 0]{} C(\varepsilon, \phi)_{K,P} \frac{2e^4}{(-K^2)(-P^2)}$$

$$\times \left(\frac{1}{t^2}\left\{(U-K^2)(t-K^2) - K^2 s\right\} + \frac{1}{U^2}\left\{(t-P^2)(U-P^2) - P^2 s\right\} \right.$$

$$\left. \frac{2}{Ut}\left\{ s(K^2+P^2) \right\} \right)$$