Plan for $P_b P_t$ Check Using Elastic Asymmetries

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4/9/14

$P_b P_t$ Check

$$A \equiv \frac{\nu_z z^* G_M^2 + \nu_x x^* G_E G_M}{(\tau G_M^2 + \epsilon G_E^2)/[\epsilon(1+\tau)]} \qquad A = \frac{1}{f P_b P_t} A_{exp}$$

$$\tau = \frac{Q^2}{4M^2}$$

$$\epsilon = \left(1 + 2(1+\tau)\tan^2\frac{\theta}{2}\right)^{-1}$$

$$\nu_z = -2\tau \tan\frac{\theta}{2}\sqrt{\frac{1}{1+\tau} + \tan^2\frac{\theta}{2}}$$

$$\nu_x = -2\tan\frac{\theta}{2}\sqrt{\frac{\tau}{1+\tau}}$$

Details of Formalism in:

Crawford, C.B. (2005), "Precision Measurement of the Proton Electric to Magnetic Form Factor Ratio with BLAST" (Thesis)

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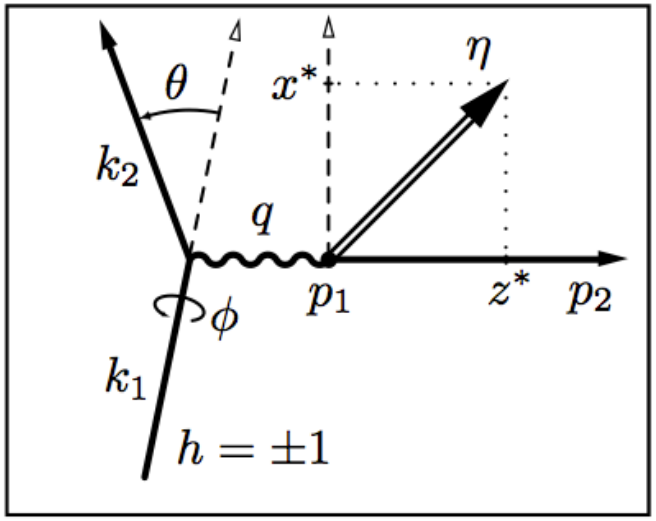
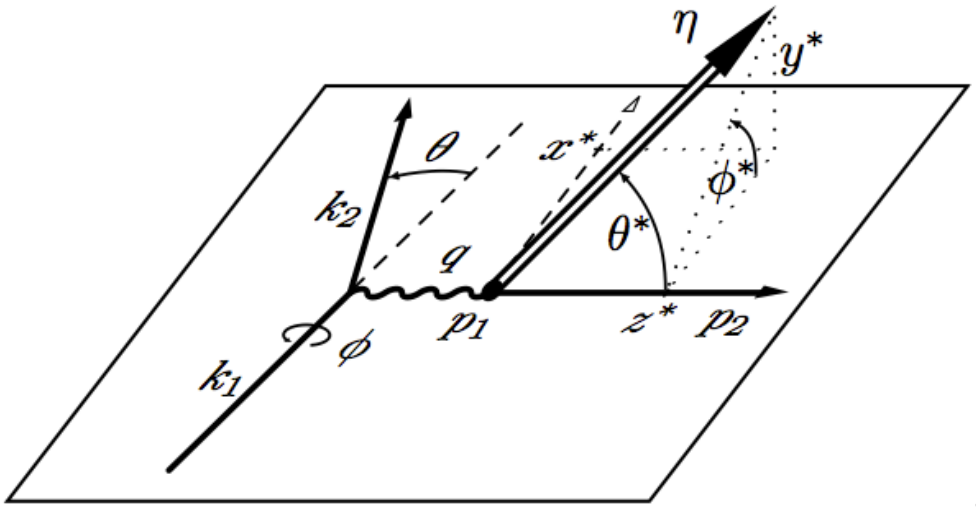
spin orientation:

$$z^* = \cos\theta^*$$

$$x^* = \sin\theta^* \cos\phi^*$$





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Form Factor Parameterization from:

"Global analysis of proton elastic form factor data with two-photon exchange corrections",
J. Arrington, et. al., Phys. Rev. C. 76 (2008) 035205

$$G_E, G_M/\mu_p = \frac{1 + \sum_{i=1}^{n} a_i \tau^i}{1 + \sum_{i=1}^{n+2} b_i \tau^i}$$

Parameter	G_M/μ_p	G_E
a_1	−1.465	3.439
a_2	1.260	−1.602
a_3	0.262	0.068
b_1	9.627	15.055
b_2	0.000	48.061
b_3	0.000	99.304
b_4	11.179	0.012
b_5	13.245	8.650

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