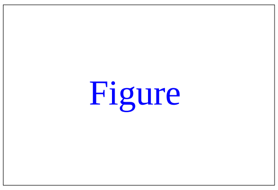

Figure 1: Radiative corrections to the measured asymmetries.

0.1 Proton Radiative Corrections

External radiative correction were applied following the formalism of Mo and Tsai [1], using the peaking approximation procedure of Ref. [2]. The internal radiative corrections utilized POLRAD [3] which had been updated to include a model of the RSS polarized data. This model was radiated, compared to the experimental data and adjusted accordingly in an iterative procedure until the chi-squared of the fit was minimized. The details of this fit have been previously detailed in the appendix of [4]. The size of the radiative corrections and the related systematic uncertainy can be seen in Fig. 1.

The radiative correction consisted of an additive and a multiplicative contribution:

$$A = \frac{A_{raw}}{f_{RC}} + A_{RC} \tag{1}$$

f_{RC} contains contributions from the elastic tail subtraction only, while A_{RC} has both elastic and inelastic contributions. In the following sections we detail how these quantities are determined.

0.1.1 Elastic Tail Subtraction

The measured asymmetry contains a contribution from elastic tail as follows:

$$A_T^{\mathrm{r}} = \frac{\Delta_T^{\mathrm{r}}}{\Sigma_T^{\mathrm{r}}} \quad = \quad \frac{\Delta_{\mathrm{in}}^{\mathrm{r}} + \Delta_{\mathrm{el}}^{\mathrm{r}}}{\Sigma_{\mathrm{in}}^{\mathrm{r}} + \Sigma_{\mathrm{el}}^{\mathrm{r}}} \tag{2}$$

where the subscripts T,el and in refer to the total measured quantity, elastic and inelastic contributions respectively. The superscript r implies the the quantity is radiated. For example, A_T^{r} represents the measured asymmetry.

To remove the radiated elastic tail, we must deal with the polarized cross section Δ:

$$\Delta_{\mathrm{in}}^{\mathrm{r}} \quad = \quad \Delta_T^{\mathrm{r}} - \Delta_{\mathrm{el}}^{\mathrm{r}} \tag{3}$$

The measured asymmetry is related to the polarized cross section as:

$$A^{\rm r}_{\rm in} = \frac{\Delta^{\rm r}_{\rm in}}{\Sigma^{\rm r}_{\rm in}} \tag{4}$$

$$= \frac{\Delta^{\rm r}_{T} - \Delta^{\rm r}_{\rm el}}{\Sigma^{\rm r}_{\rm in}} \tag{5}$$

$$= \frac{\Sigma^{\rm r}_{T} A^{\rm r}_{T} - \Delta^{\rm r}_{\rm el}}{\Sigma^{\rm r}_{\rm in}} \tag{6}$$

$$= \left(\frac{\Sigma^{\rm r}_{T}}{\Sigma^{\rm r}_{\rm in}}\right) A^{\rm r}_{T} - \frac{\Delta^{\rm r}_{\rm el}}{\Sigma^{\rm r}_{\rm in}} \tag{7}$$

$$= \frac{1}{f} A^{\rm r}_{T} - A_{rc} \tag{8}$$

where we have made the following definitions:

$$f = \frac{\Sigma^{\rm r}_{\rm in}}{\Sigma^{\rm r}_{T}} \tag{9}$$

$$A_{rc} = \frac{\Delta^{\rm r}_{\rm el}}{\Sigma^{\rm r}_{\rm in}} \tag{10}$$

So f_{RC} is completely determined by the model [5] of the unpolarized cross section f_{RC} is the only part of the radiative correction to affect the statistical errors. A_{RC} requires both the unpolarized model and knowledge of the elastic asymmetry [6] to form $\Delta^{\rm r}_{\rm el}$.

0.1.2 Inelastic Radiative Correction

To be written...

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