

Systematic errors

Scale is set by EDM asymmetry = 2.9×10^{-5} .

Left/right asymmetries from position misalignment.

“typical” angle change: $\phi = \frac{x \cos \theta}{R}$

$$\phi \frac{\sigma'(\theta)}{\sigma(\theta)} < 2.9 \times 10^{-5} \quad x < 0.0025 \text{ cm}$$

Control this error by including spin flip:

$$r = \sqrt{\frac{L(+)\,R(-)}{L(-)\,R(+)}} \quad \varepsilon = p \frac{3}{2} A_y = \frac{r-1}{r+1}$$

This cancels “solid angle” and +/- luminosity changes.

Errors appear as fractions of the measured asymmetry.

Errors can appear as “conspiracies” between spin and detector. In this case, other rate asymmetries that drive such effects are absent.

Rotational crosstalk:

$$\zeta \beta < 1.2 \times 10^{-4}$$

misalignment fraction
(degrees ~ %)

“freezing” angle error

Each angle must be controlled to better than 1° .

Checks can be made using vertical or in-plane polarization.