K 223 – Angular γγ-correlations

Preparation tasks

1 – Which distances?

- How does the count rate of one detector change with the distance?

$$N \propto \frac{1}{r^2}$$

- How does the coincidence rate change with the distance?

$$N_c \propto \frac{1}{r^2}$$

- How does the asymmetry seen in the experiment differ from the theoretical prediction?

we can only move one detector? → $1/r$

- How do the factors influence the error?

$$R_{kk} = \frac{R_{kk}^{exp}}{Q_{kk}} \qquad \Delta R_{kk}^2 = \left(\frac{1}{Q_{kk}} \Delta R_{kk}^{exp}\right)^2 + \left(\frac{2 R_{kk}^{exp}}{Q_{kk}^3} \Delta Q_k\right)^2$$

$\to 0 \quad Q_k \to 1$

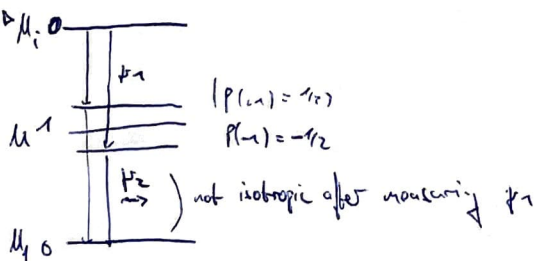
2 – Which angles?

- most important maximum and falling flanks

3 – How to correct for de-adjustment?

- if the source is not aligned we do not measure isotropically distributed angular photons
- renormalize $n_c \to \frac{n_c(\theta_0)}{n_c(\theta)} \cdot n_c$

Knowledge

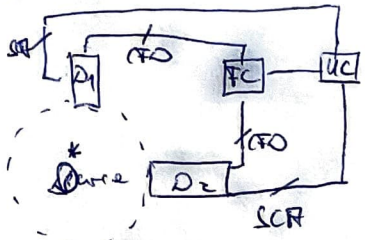


- $W(\theta) \propto P_\ell(\cos\theta)$ (ℓ_{kk}) $\qquad P(M) = \sum_{M_i} \sigma_1(M_i \to M)\, F_{\ell_1 m_1}(\delta_1)$

- $W(\theta) = \sum_{M, M_f} P(M)\, \sigma_1(M \to M_f)\, F_{\ell_2 m_2}(\theta)$

- distorted by HFS interactions $\qquad \theta_2 - \theta_1$

△ not all measured coincidences are real → <u>random</u> coincidences

△ 

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