Obtaining mixing ratio data from Conversion Coefficients

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If we know experimentally α_i, with i="total", "k", "l", "l_1", …and assume mixed multipolarity M=m_1+m_2

$$\alpha_i = \frac{1}{1+\delta^2}\alpha_i(m_1) + \frac{\delta^2}{1+\delta^2}\alpha_i(m_2)$$

in short form: $\alpha_i = a\alpha_{1i} + (1-a)\alpha_{2i}$

Use BRICC to obtain α_{1i} and α_{2i}

Chi-square to be minimized: $\chi^2 = \sum_i \frac{1}{\Delta\alpha_i^2}(\alpha_i - a(\alpha_{1i} - \alpha_{2i}) - \alpha_{2i})^2$

Solution: $a = (S_1 - S_2)/S_3$

$$S_1 = \sum_i \frac{1}{\Delta\alpha_i^2}\alpha_i(\alpha_{1i} - \alpha_{2i}) \qquad S_2 = \sum_i \frac{1}{\Delta\alpha_i^2}\alpha_{2i}(\alpha_{1i} - \alpha_{2i}) \qquad S_3 = \sum_i \frac{1}{\Delta\alpha_i^2}(\alpha_{1i} - \alpha_{2i})^2$$

$$\Delta a = [\sum_i (\Delta\alpha_i \frac{\partial a}{\partial \alpha_i})^2]^{1/2} = 1/S_3^{1/2}$$

Example

α=2.0 +- 0.2
α_k=1.8 +- 0.1
α_l=0.3 +- 0.03
Z=63
E_{gamma}=120 keV

Multipolarity=E1+M2

d=0.5424 +- 0.01676

σ_{n-1}=2.01

	E1	M2	E1+M2
total	0.1657	8.585	2.0794
k	0.1398	6.616	1.6118
l	0.0204	1.527	0.3628

Summary

How to proceed?

- Include gamma energy uncertainty
- Offer program on the internet
- Comments?