

Espectroscopia β

Mestrado em Engenharia Física Tecnológica
LFAOFR

Gonalo Castro ¹, Ant3nio Costa ², Miguel Gonalves ³, Pedro
Pereira ⁴

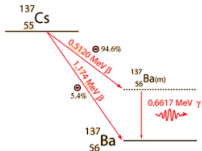
Instituto Superior T3cnico

¹₇₈₄₉₇ ²₇₈₆₅₃ ³₇₈₈₅₀ ³₇₈₈₈₉

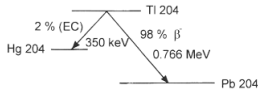
14 de Janeiro de 2016

Decaimento β

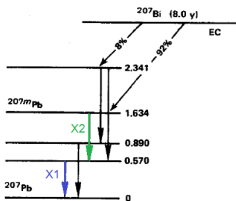
$$n \rightarrow p + e^{-} + \bar{\nu}_e$$



(a) Esquema Decaimento $^{137}_{55}\text{Cs}$



(b) Esquema Decaimento $^{204}_{81}\text{Tl}$



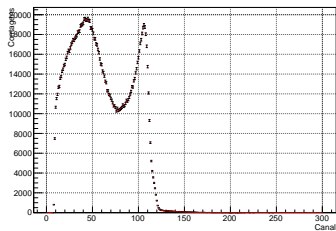
(c) Esquema Decaimento $^{207}_{83}\text{Bi}$

$$E_{e^-} = E_X - E_{L_j} \tag{1}$$

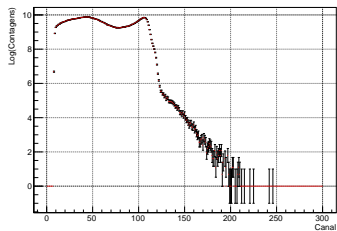
Espectro de $^{137}_{55}\text{Cs}$

Calibração

Espectro Linear Cs



Espectro Logaritmico Cs



Calibração canal-tensão

Calibração

$$\bar{c} = \frac{\sum_{n=1}^n c_i n_i}{A} \quad (2)$$

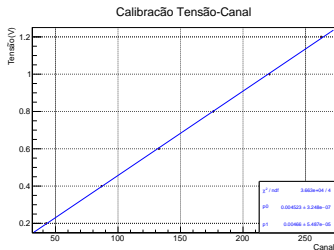
$$A = \sum_{n=1}^n n_i \quad (3)$$

$$\sigma_{\bar{c}} = \frac{\sqrt{\sum_{n=1}^n (c_i - \bar{c})^2 \cdot n_i}}{A} \quad (4)$$

Calibração canal-tensão

Calibração

Tensão(V)	Canal	Contagens	Canal Médio	Contagens Totais
0.2	41	106	42.54 ± 0.01	2429 ± 10
	42	1028		
	43	1180		
	44	113		
	45	1		
	46	1		
0.4	85	12	86.88 ± 0.01	2427 ± 3
	86	604		
	87	1477		
	88	328		
	89	6		
0.6	131	40	132.79 ± 0.01	2427 ± 6
	132	699		
	133	1424		
	134	260		
	135	4		
0.8	174	6	176.23 ± 0.01	2428 ± 2
	175	224		
	176	1434		
	177	735		
	178	29		
1	219	2	221.26 ± 0.01	2428 ± 1
	220	229		
	221	1368		
	222	791		
	223	38		
1.2	260	33	262.49 ± 0.01	2427 ± 2
	261	95		
	262	1054		
	263	1137		
	264	108		



Espectro de $^{204}_{81}Tl$

Endpoint de $^{204}_{81}Tl$

Ajuste de Kurie

Endpoint de $^{204}_{81}Tl$

Ajuste de Kurie

Endpoint de $^{204}_{81}Tl$