^{23}Al $\varepsilon+\beta^+$ decay:XUNDL-20 2025Go00

Parent: ^{23}Al: E=0; $J^\pi=5/2^+$; $T_{1/2}$=452 ms *4*; Q(ε)=12221.7 *3*; %ε+%β^+ decay=100
^{23}Al-J^π: From Adopted Levels of ^{23}Al in ENSDF database.
^{23}Al-$T_{1/2}$: From decay time distribution (2025Go00).
^{23}Al-Q($\varepsilon+\beta^+$): from 2021Wa16.
Compiled (unevaluated) dataset from 2025Go00: Phys Rev C xxx, xx43xx (2025).
Compiled by L. J. Sun (FRIB, MSU), November 24, 2024.
2025Go00: ^{23}Al εp decay – measured E_γ, I_γ, E_p, I_p, pγ-coin, $\gamma\gamma$-coin, decay-time distribution using the Gaseous Detector with Germanium Tagging system. Normalized I_p relative to I_p (839 keV (lab)) of 2011Sa15.

^{23}Mg Levels

E(level)	J^π	Comments
0.0 *0*	$3/2^+$	
450.98 *12*	$5/2^+$	
2050.69 *11*	$7/2^+$	
2357.84 *30*	$1/2^+$	
2714.00 *18*	$9/2^+$	
2769.9 *6*	$1/2^-$	
2904.52 *15*	$3/2^+$	
3859.76 *32*	$3/2^+,5/2^+$	
4681.53 *25*	$7/2^+$	
5288.83 *29*	$3/2^+,5/2^+$	
5654.4 *7*	$5/2^+$	
5691.5 *4*	$(1/2to9/2)^+$	
5711.0 *8*	$1/2^+,3/2^+,5/2^+$	
6129.7 *7*	$7/2^-$	
6238.9 *10*	$9/2^+$	
6514.6 *6*	$7/2^+$	
6545.1 *5*	$3/2^+,5/2^+$	
6574.5 *4*	$5/2^+$	
6907.1 *6*	$5/2^+$	
6987.15 *31*	$5/2^+$	
7787.3 *5*	$3/2^+,5/2^+$	E(p)(c.m.)=204 *20* (2025Go00).
7803.4 *5*	$5/2^+$	J^π: IAS of ^{23}Al g.s.
7856.2 *4*	$7/2^+$	E(p)(c.m.)=275 *20* (2025Go00).
8163.10 *12*	$5/2^+$	E(p)(c.m.)=583 *20* (2025Go00).
8449	$3/2^+,5/2^+$	E(p)(c.m.)=869 *20* (2025Go00).
8578	$3/2^+,5/2^+,7/2^+$	E(p)(c.m.)=869 *20* (2025Go00).
8762	$3/2^+$	E(p)(c.m.)=595 *20* (2025Go00).
8793	$(7/2^+)$	
8840	$3/2^+,5/2^+,7/2^+$	
8908	$(5/2^+)$	
9022	$3/2^+,5/2^+,7/2^+$	
9102	$3/2^+,5/2^+,7/2^+$	
9135	$3/2^+,5/2^+,7/2^+$	
9325	$3/2^+,5/2^+,7/2^+$	
9374	$7/2^+$	E(p)(c.m.)=898 *20* (2025Go00).
9421	$3/2^+,5/2^+,7/2^+$	
9468	$3/2^+,5/2^+,7/2^+$	
9604	$3/2^+,5/2^+,7/2^+$	
9673	$3/2^-$	

^{23}Al $\varepsilon+\beta^+$ decay:XUNDL-20 2025Go00 (continued)

ε,β^+ radiations

E(decay)	E(level)	I($\varepsilon+\beta^+$)†	Comments
(2548.7 *15*)	9673	8.3×10^{-4} *21*	
(2617.7 *15*)	9604	0.00257 *31*	
(2753.7 *15*)	9468	0.0085 *7*	
(2800.7 *15*)	9421	0.0216 *12*	
(2847.7 *15*)	9374	0.130 *15*	
(2896.7 *15*)	9325	0.0060 *5*	
(3086.7 *15*)	9135	0.0174 *11*	
(3119.7 *15*)	9102	0.0032 *6*	
(3199.7 *15*)	9022	0.00319 *32*	
(3313.7 *15*)	8908	0.0170 *10*	
(3381.7 *15*)	8840	0.0059 *5*	
(3428.7 *15*)	8793	0.0131 *8*	
(3459.7 *15*)	8762	0.206 *15*	
(3643.7 *15*)	8578	0.0064 *5*	
(3772.7 *15*)	8449	0.285 *23*	
(4058.6 *11*)	8163.10	0.078 *7*	
(4365.5 *11*)	7856.2	0.34 *4*	%Ip=0.121 *8* (2025Go00).
(4418.3 *12*)	7803.4	14.9 *8*	
(4434.4 *12*)	7787.3	3.96 *23*	%Ip=0.026 *3* (2025Go00), Ip=0.0257 *17* (2020Fr04).
(5234.6 *11*)	6987.15	4.43 *20*	
(5314.6 *12*)	6907.1	0.38 *5*	
(5647.2 *11*)	6574.5	3.73 *20*	
(5676.6 *12*)	6545.1	0.52 *6*	
(5707.1 *12*)	6514.6	2.36 *19*	
(5982.8 *15*)	6238.9	0.056 *15*	
(6092.0 *13*)	6129.7	0.058 *13*	
(6510.7 *13*)	5711.0	0.19 *4*	
(6530.2 *11*)	5691.5	1.34 *10*	
(6567.3 *13*)	5654.4	0.39 *4*	
(6932.9 *11*)	5288.83	0.85 *6*	
(7540.2 *11*)	4681.53	0.47 *4*	
(8361.9 *11*)	3859.76	0.106 *33*	
(9317.2 *11*)	2904.52	1.93 *16*	
(9451.8 *12*)	2769.9	0.051 *11*	
(9863.9 *11*)	2357.84	0.176 *26*	
(10171.0 *11*)	2050.69	3.9 *4*	
(11770.7 *11*)	450.98	22.8 *26*	
(12221.7 *11*)	0.0	36.3 *16*	

† Absolute intensity per 100 decays.

$\gamma(^{23}Mg)$

E_γ	I_γ†	E_i(level)	J_i^π	E_f	J_f^π	Comments
450.74 *23*	44.3 *25*	450.98	$5/2^+$	0.0	$3/2^+$	%Iγ=44
662.97 *20*	0.125 *22*	2714.00	$9/2^+$	2050.69	$7/2^+$	%Iγ=0.13
1599.50 *12*	5.6 *4*	2050.69	$7/2^+$	450.98	$5/2^+$	%Iγ=5.6
1831.6 *6*	0.058 *15*	5691.5	$(1/2\text{to}9/2)^+$	3859.76	$3/2^+,5/2^+$	%Iγ=0.058
1906.72 *29*	0.120 *18*	2357.84	$1/2^+$	450.98	$5/2^+$	%Iγ=0.12
1966.9 *5*	0.080 *16*	4681.53	$7/2^+$	2714.00	$9/2^+$	%Iγ=0.08
2050.77 *14*	0.80 *6*	2050.69	$7/2^+$	0.0	$3/2^+$	%Iγ=0.8
2263.26 *24*	0.218 *23*	2714.00	$9/2^+$	450.98	$5/2^+$	%Iγ=0.22
2358.3 *9*	0.056 *19*	2357.84	$1/2^+$	0.0	$3/2^+$	%Iγ=0.056
2453.52 *17*	1.16 *8*	2904.52	$3/2^+$	450.98	$5/2^+$	%Iγ=1.2

Continued on next page (footnotes at end of table)

^{23}Al $\varepsilon+\beta^+$ decay:XUNDL-20 2025Go00 (continued)

$\gamma(^{23}Mg)$ (continued)

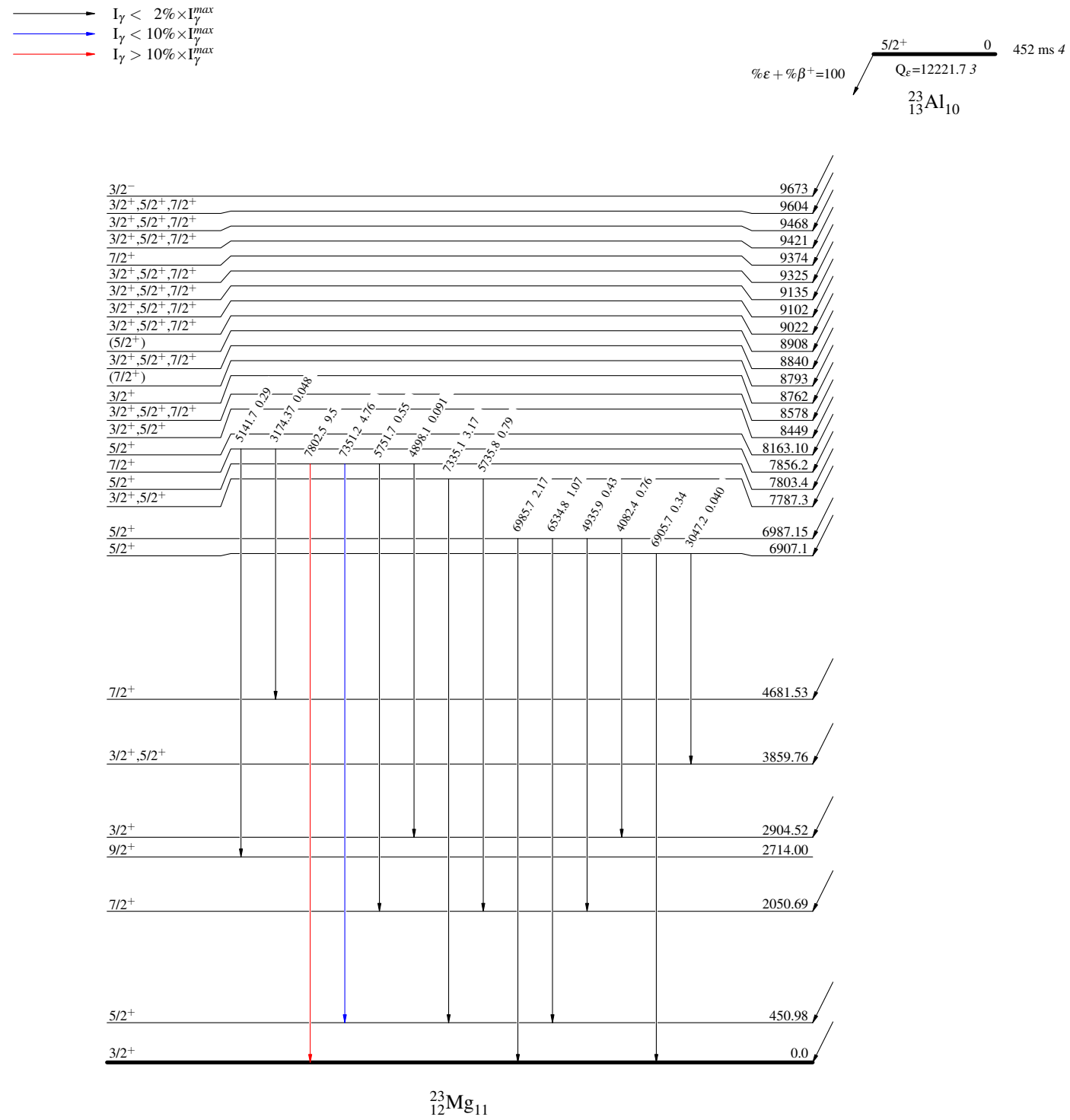
E_γ	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Comments
2630.83 *30*	0.130 *15*	4681.53	$7/2^+$	2050.69	$7/2^+$	%Iγ=0.13
2685.3 *4*	0.066 *12*	6545.1	$3/2^+,5/2^+$	3859.76	$3/2^+,5/2^+$	%Iγ=0.066
2769.7 *6*	0.051 *11*	2769.9	$1/2^-$	0.0	$3/2^+$	%Iγ=0.051
2904.21 *21*	1.73 *12*	2904.52	$3/2^+$	0.0	$3/2^+$	%Iγ=1.7
3047.2 *7*	0.040 *11*	6907.1	$5/2^+$	3859.76	$3/2^+,5/2^+$	%Iγ=0.04
3174.37 *35*	0.048 *11*	7856.2	$7/2^+$	4681.53	$7/2^+$	%Iγ=0.048
3238.19 *33*	0.199 *19*	5288.83	$3/2^+,5/2^+$	2050.69	$7/2^+$	%Iγ=0.2
3415.4 *7*	0.058 *13*	6129.7	$7/2^-$	2714.00	$9/2^+$	%Iγ=0.058
3640.9 *6*	0.101 *15*	5691.5	$(1/2to9/2)^+$	2050.69	$7/2^+$	%Iγ=0.1
3669.9 *6*	0.106 *16*	6574.5	$5/2^+$	2904.52	$3/2^+$	%Iγ=0.11
3859.6 *4*	0.270 *24*	3859.76	$3/2^+,5/2^+$	0.0	$3/2^+$	%Iγ=0.27
4082.4 *4*	0.76 *6*	6987.15	$5/2^+$	2904.52	$3/2^+$	%Iγ=0.76
4187.8 *10*	0.056 *15*	6238.9	$9/2^+$	2050.69	$7/2^+$	%Iγ=0.056
4230.2 *5*	0.310 *27*	4681.53	$7/2^+$	450.98	$5/2^+$	%Iγ=0.31
4465.6 *14*	0.083 *17*	6514.6	$7/2^+$	2050.69	$7/2^+$	%Iγ=0.083
4836.4 *5*	0.54 *5*	5288.83	$3/2^+,5/2^+$	450.98	$5/2^+$	%Iγ=0.54
4898.1 *11*	0.091 *20*	7803.4	$5/2^+$	2904.52	$3/2^+$	%Iγ=0.091
4935.9 *6*	0.43 *4*	6987.15	$5/2^+$	2050.69	$7/2^+$	%Iγ=0.43
5141.7 *8*	0.29 *4*	7856.2	$7/2^+$	2714.00	$9/2^+$	%Iγ=0.29
5242.1 *15*	0.28 *7*	5691.5	$(1/2to9/2)^+$	450.98	$5/2^+$	%Iγ=0.28
5260.9 *12*	0.082 *27*	5711.0	$1/2^+,3/2^+,5/2^+$	450.98	$5/2^+$	%Iγ=0.082
5289.3 *11*	0.114 *26*	5288.83	$3/2^+,5/2^+$	0.0	$3/2^+$	%Iγ=0.11
5653.6 *7*	0.39 *4*	5654.4	$5/2^+$	0.0	$3/2^+$	%Iγ=0.39
5689.7 *7*	0.90 *7*	5691.5	$(1/2to9/2)^+$	0.0	$3/2^+$	%Iγ=0.9
5709.0 *11*	0.110 *27*	5711.0	$1/2^+,3/2^+,5/2^+$	0.0	$3/2^+$	%Iγ=0.11
5735.8 *6*	0.79 *6*	7787.3	$3/2^+,5/2^+$	2050.69	$7/2^+$	%Iγ=0.79
5751.7 *7*	0.55 *5*	7803.4	$5/2^+$	2050.69	$7/2^+$	%Iγ=0.55
6062.3 *8*	2.15 *18*	6514.6	$7/2^+$	450.98	$5/2^+$	%Iγ=2.2
6122.4 *7*	2.08 *16*	6574.5	$5/2^+$	450.98	$5/2^+$	%Iγ=2.1
6513.0 *12*	0.130 *33*	6514.6	$7/2^+$	0.0	$3/2^+$	%Iγ=0.13
6534.8 *8*	1.07 *9*	6987.15	$5/2^+$	450.98	$5/2^+$	%Iγ=1.1
6543.0 *10*	0.45 *6*	6545.1	$3/2^+,5/2^+$	0.0	$3/2^+$	%Iγ=0.45
6573.3 *8*	1.54 *11*	6574.5	$5/2^+$	0.0	$3/2^+$	%Iγ=1.5
6905.7 *10*	0.34 *5*	6907.1	$5/2^+$	0.0	$3/2^+$	%Iγ=0.34
6985.7 *9*	2.17 *16*	6987.15	$5/2^+$	0.0	$3/2^+$	%Iγ=2.2
7335.1 *9*	3.17 *22*	7787.3	$3/2^+,5/2^+$	450.98	$5/2^+$	%Iγ=3.2
7351.2 *9*	4.76 *33*	7803.4	$5/2^+$	450.98	$5/2^+$	%Iγ=4.8
7802.5 *9*	9.5 *7*	7803.4	$5/2^+$	0.0	$3/2^+$	%Iγ=9.5

[†] Absolute intensity per 100 decays.

^{23}Al ε decay:XUNDL-20 2025Go00

Decay Scheme

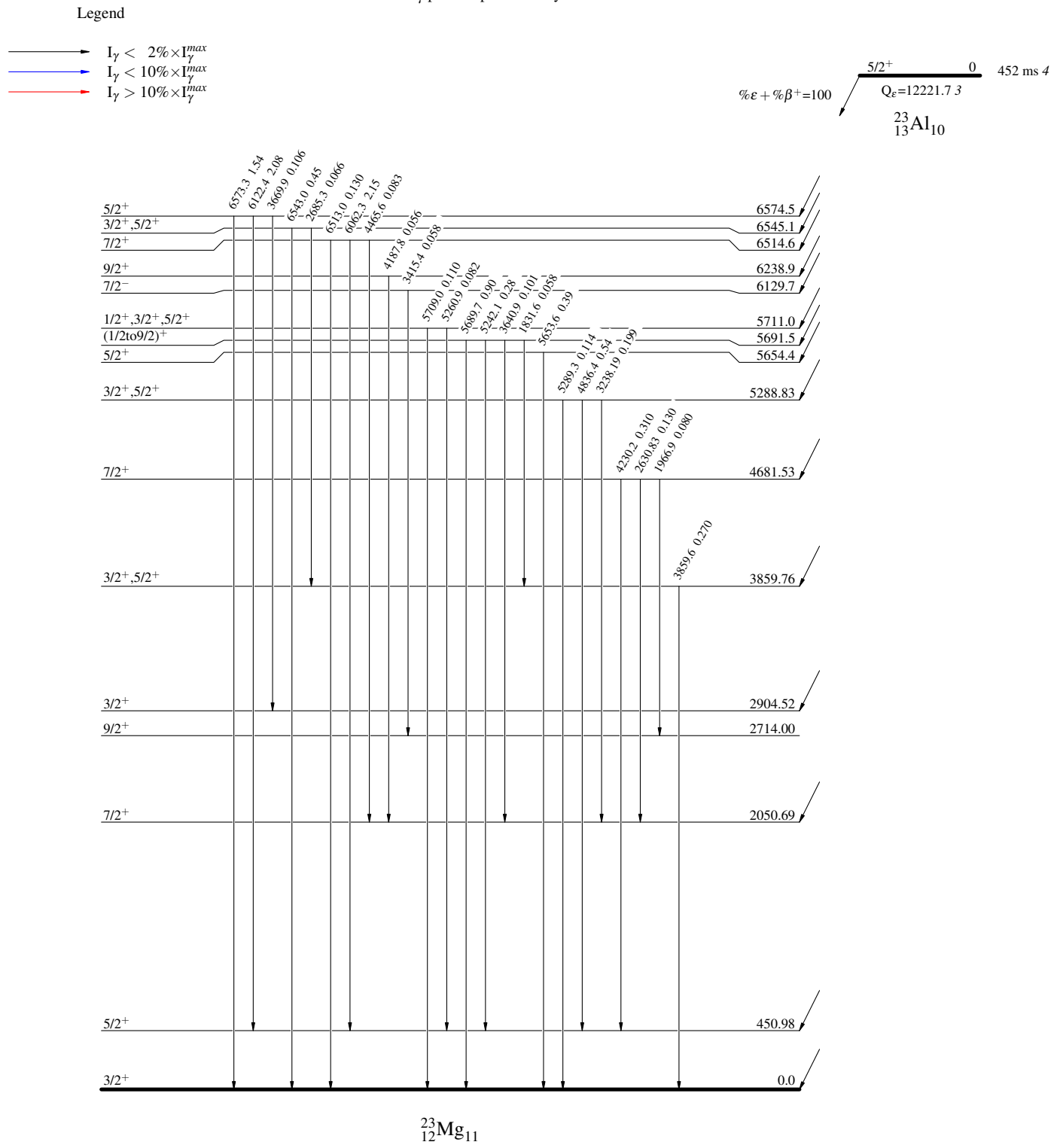
Intensities: I_γ per 100 parent decays



^{23}Al ε decay:XUNDL-20 2025Go00

Decay Scheme (continued)

Intensities: I_γ per 100 parent decays



^{23}Al ε decay:XUNDL-20 2025Go00

Decay Scheme (continued)

Intensities: I_γ per 100 parent decays