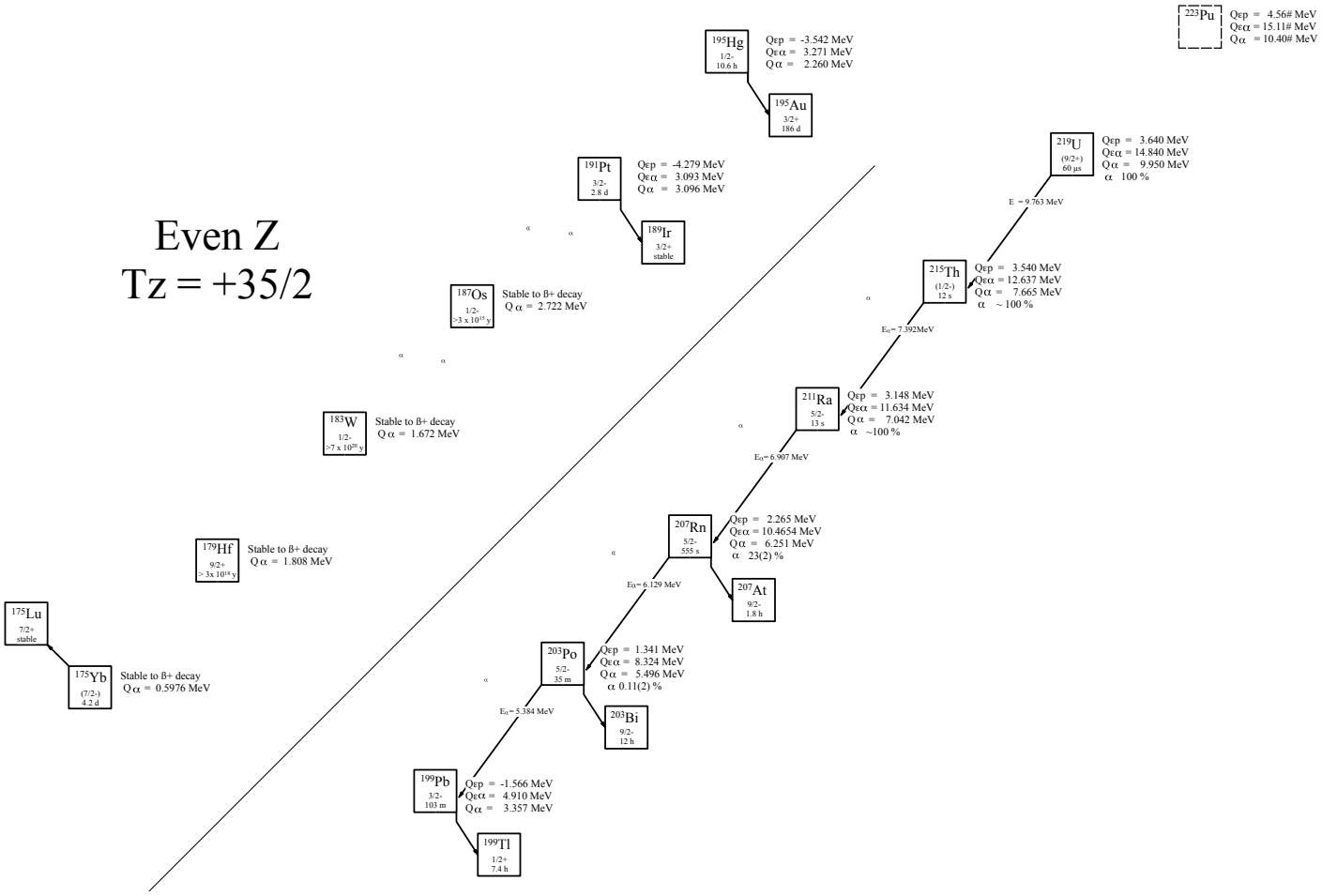

Fig. 1: Known experimental values for heavy particle emission of the even-Z T_z= +35/2 nuclei.

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Table 1
Observed and predicted β-delayed particle emission from the even-Z, T_z = +35/2 nuclei. J^π values for ^{175}Yb, ^{175}Lu, ^{179}Hf, ^{183}W, ^{187}Os, ^{191}Pt, ^{195}Hg and ^{199}Pb are taken from ENSDF. Unless otherwise stated, all Q-values are taken from [2021Wa16] or deduced from values therein.

Nuclide	J^π	$T_{1/2}$	Q_ε	$Q_{\varepsilon p}$	$Q_{\varepsilon\alpha}$	Experimental
^{175}Yb*	$(7/2^-)$	4.185(1) d	-2.390(50)	——	——	[**1989Ab05**]
^{179}Hf	$9/2^+$	$\geq 2.7 \times 10^{18}$ y	-1.404(5)	——	——	[**2021Br09**]
^{183}W	$1/2^-$	$\geq 6.7 \times 10^{20}$ y	-1.072(2)	——	——	[**2011Be39**]
^{187}Os	$1/2^-$	$\geq 3.2 \times 10^{15}$ y	-0.002	——	——	[**2020Be23**]
^{191}Pt	$3/2^-$	2.817(4) d**	1.010(4)	-4.279(4)	3.093(4)	[**2000Mo05, 1994Pa16**]
^{195}Hg	$1/2^-$	10.69(3) h***	1.554(23)	-3.542(23)	3.271(23)	[**2015Do01, 2001Li17**]
^{199}Pb	$3/2^-$	103.0(14) m	2.828(29)	-1.566(7)	4.910(7)	[**2014Pa07**]
^{203}Po	$5/2^-$	34.8(5) m$^{@}$	4.214(14)	1.341(6)	8.324(28)	[**1970DaZM, 1970Jo26, 1967Le21**]
^{207}Rn	$5/2^-$	555(10) s	4.593(13)	2.265(6)	10.465(14)	[**1971Ho01**]
^{211}Ra	$5/2^-$	13(2) s$^{@@}$	4.972(13)	3.148(7)	11.634(13)	[**2019Zh54, 1968Lo15, 1967Va22**]
^{215}Th	$(1/2^-)$	12(2) s	4.891(14)	3.540(8)	12.637(14)	[**1968Va18**]
^{219}U	$(9/2^+)$	60(7) μs	4.710(70)	3.640(17)	14.840(18)	[**2019Zh54**]
^{223}Pu			5.46(31)#	4.56(30)#	15.11(31)#	

* 100% β^- emitter.
** Weighted average of 2.862(7) d [2000Mo05] and 2.802(4) d [1994Pa16].
*** Weighted average of 10.84(3) h [2015Do01] and 10.53(3) h [2001Li17].
$^{@}$ Weighted average of 36.7(5) m [1970DaZM], 33(1) m [1970Jo26] and 29(1) m [1967Le21].
$^{@@}$ Weighted average of 10(3) s [2019Zh54], 1592) s [1968Lo15] and 12(2) s [1967Va22].

Table 2
Particle separation, Q-values, and measured values for direct particle emission of the even-Z, T_z = +35/2 nuclei. Unless otherwise stated, all S and Q-values are taken from [2021Wa16] or deduced from values therein.

Nuclide	S_p	S_{2p}	Q_α	BR_α	Experimental
^{175}Yb	8.120(45)	15.62(20)	0.597(1)		
^{179}Hf	7.414(2)	14.055(1)	1.808(1)		
^{183}W	7.224(2)	13.541(2)	1.672(2)		
^{187}Os	6.581(1)	12.409(1)	2.722(1)		
^{191}Pt	6.234(4)	11.289(4)	3.096(4)		
^{195}Hg	6.090(23)	11.112(23)	2.260(24)		
^{199}Pb	4.992(10)	9.269(8)	3.357(24)		
^{203}Po	3.849(15)	6.618(15)	5.496(5)	0.11(2)%	[**1970Ra14, 1968Go12, 1967Le21**, 1970DaZM, 1967Ti04, 1963Be28, 1962Be26, 1961Be25, 1961Fo05, 1959AtXX, 1951Ka03]
^{207}Rn	3.484(14)	5.691(11)	6.251(2)	23(2)%	[**1993Wa04, 1971Go35, 1971Ho01**, 1971Jo19, 1967Va07, 1967Va17, 1967Va20, 1957St10, 1954Bu67]
^{211}Ra	3.114(14)	4.805(11)	7.042(3)	$\approx$ 100%*	[**2003He06**, 2019Zh54, 2007Le14, 1968Lo15, 1967Va22]
^{215}Th	2.801(15)	4.002(12)	7.665(4)	$\approx$ 100%*	[**2005Ku31**, 2007Le14, 2000He17, 1989He03, 1968Va18, 1968Va10]
^{219}U	2.643(22)	3.488(17)	9.950(12)	100%*	[**2019Zh54**, 2007Le14, 2006LeZR, 2005Le42, 1994AnZY, 1994Ye08, 1993An07]
^{223}Pu	2.44(30)#	2.98(31)#	10.40(30)#		

* Not measured. Based on half-life.

Table 3
direct α emission from ^{203}Po, $J_i^\pi = 5/2^-$, $T_{1/2}$ = 34.8(5) m*, BR_α = 0.11(2)%**.

E_α(c.m.)	E_α(lab)	I_α(abs)	J_f^π	$E_{daughter}$(^{199}Pb)	coincident γ-rays	R_0 (fm)]	HF
5.492(3)	5.384(3)***	0.11(2)%**		0.0	——	1.4673(21)	$1.15^{+0.29}_{-0.20}$

* Weighted average of 36.7(5) m [1970DaZM], 33(1) m [1970Jo26] and 29(1) m [1967Le21].
** [1967Le21].
*** [1970Ra14, 1968Go12].

Table 4
direct α emission from ^{207}Rn, $J_i^\pi = 5/2^-$, $T_{1/2}$ = 555(10) s*, BR_α = 23(2)%*.

E_α(c.m.)	E_α(lab)	I_α(rel)	I_α(abs)	J_f^π	$E_{daughter}$(^{203}Po)	coincident γ-rays	R_0 (fm)]	HF
6.113(4)	5.995(4)	0.10(3)%	0.023(7)%	$(1/2^-)$	0.137		1.4836(40)	260^{+130}_{-70}
6.188(3)	6.068(3)	0.66(2)%	0.15(1)%	$(3/2^-)$	0.063	0.063	1.4836(40)	84(11)
6.2502(25)	6.1294(25)**	100%	23(2)%	$5/2^-$	0.0	——	1.4836(40)	1.05(13)

* [1971Ho01].
** [1993Wa04]

Table 5
direct α emission from ^{211}Ra*, $J_i^\pi = 5/2^-$, $T_{1/2}$ = 13(2) s**, $BR_\alpha = \approx 100\%$.

E_α(c.m.)	E_α(lab)	I_α(rel)***	I_α(abs)***	J_f^π	$E_{daughter}$(^{207}Rn)	coincident γ-rays	R_0 (fm)]	HF
6.376(5)	6.255(5)	0.06%	≈0.06%	$(9/2^-)$	0.6650(1)	0.6650(1)	1.4790(30)	4.3
6.437(10)	6.315(10)	0.04%	≈0.04%		0.6016(3)	0.6016(3)	1.4790(30)	12
6.442(10)	6.32(10)	7×10^{-5}%	$\approx 7 \times 10^{-5}$%		0.5691(3)	0.5691(3)	1.4790(30)	90
6.755(5)	6.627(5)	0.08%	≈0.08%	$(1/2^-, 3/2^-)$	0.2830(1)	0.1200, 0.1629, 0.2830(1)	1.4790(30)	120
6.919(5)	6.788(5)	1%	≈1%	$3/2^-$	0.1200(1)	0.1200(1)	1.4790(30)	40
7.040(5)	6.907(5)	100%	≈99%	$5/2^-$	0.0	——	1.4790(30)	1.14(20)

* All values from [2003He06], except where noted.
** Weighted average of 10(3) s [2019Zh54], 1592) s [1968Lo15] and 12(2) s [1967Va22].
*** No uncertainties are given in [2003He06].

Table 6
direct α emission from ^{215}Th*, $J_i^\pi = (1/2^-)$, $T_{1/2}$ = 1.2(2) s**, $BR_\alpha = \approx 100\%$.

E_α(c.m.)	E_α(lab)	I_α(rel)	I_α(abs)	J_f^π	$E_{daughter}$(^{211}Ra)	coincident γ-rays	R_0 (fm)]	HF
7.373(7)	7.236(7)	1.9(8)%	1.0(4)%	$(3/2^-)$	0.2951(3)	0.2951(3)	1.4841(35)	31^{+30}_{-13}
7.474(5)	7.335(5)	15.4%	8%***	$(3/2^-)$	0.1945(1)	0.0609(3), 0.1945(1)	1.4841(35)	9
7.532(4)	7.392(4)	100%	52%***	$(1/2^-)$	0.1339(1)	0.1339(1)	1.4841(35)	2.2
7.666(5)	7.523(5)	76.9%	40%***	$5/2(^-)$	0.0	——	1.4841(35)	8

* All values from [2005Ku31], except where noted.
** [1968Va18].
*** No uncertainties are given in [2003He06].

Table 7
direct α emission from ^{219}U*, $J_i^\pi = (9/2^+)$, $T_{1/2}$ = 60(7) μs, BR_α = 100%.

E_α(c.m.)	E_α(lab)	I_α(rel)	I_α(abs)	J_f^π	$E_{daughter}$(^{215}Th)	coincident γ-rays	R_0 (fm)]	HF
9.142(17)	8.975(17)	$7.3^{+4.2}_{-3.0}$%	$6.5^{+3.7}_{-2.6}$%	$(3/2^-)$	0.807(23)		1.516(14)	19^{+31}_{-9}
9.418(17)	9.246(17)	$4.8^{+4.4}_{-2.4}$%	$4.3^{+3.9}_{-2.1}$%	$(5/2^-)$	0.527(23)		1.516(14)	$1.1^{+6.9}_{-0.7} \times 10^3$
9.945(15)	9.763(15)	100(11)%	89.2(9.8)	$(1/2^-)$	0.0	——	1.516(14)	110^{+50}_{-40}

* All values from [2019Zh45].

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