^{236}U(n,γ):resonance capture 1979Vo05,1972Ro09,1990Ma09

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 107, 3323 (2006)	15-Mar-2006

Other measurements: 1972Th01, 1976Ca03, 1981St16, 1981Su10, 1982Be55.

1979Vo05: E(n)=5.45, 29.8, 34.1, 43.7, 71.1, 86.2 and 120.5+124.4 eV (1979Vo05). E(n)=2 keV and 24 keV for the average resonance n-capture (1979Vo05). E(n)=5 eV *100*00 keV; fission cross-sections following neutron captures were measured; the existence of the superdeformed structure was suggested in 1994Pa02 from the resonances observed in their ^{236}U(n,F) data. The data indicated that these resonances were weakly populated.

1972Ro09: E(n)=0.5-2.6 MeV; deduced possible collective levels in the second potential well.

1990Ma09: E(n)=20 eV *1* 1 MeV; measured resonances and deduced parameters.

^{237}U Levels

See 1986Vo05 for calculations of nuclear level densities and level spacings by using data obtained in 1979Vo05. See also 1981St16 for a study of nuclear level densities obtained from resonance average capture γ-ray spectra.

E(level)[†]	J$^\pi$[‡]	E(level)[†]	J$^\pi$[‡]	E(level)[†]
0.07 *12*	1/2$^+$,3/2$^+$	1201.42 *25*	1/2$^{(-)}$,3/2$^{(-)}$	1738
11.38 *12*	1/2$^+$,3/2$^+$	1215?		1755
56.47[#] *22*	5/2$^+$	1229.6[#] *5*	1/2$^+$,3/2$^+$	1757
159.7 *4*	5/2$^+$	1268.8[a] *7*	1/2$^+$,3/2$^+$,5/2$^+$	1760
540.59 *9*	1/2$^-$,3/2$^-$	1287.0 *5*	1/2$^+$,3/2$^+$	1798
554.91 *7*	1/2$^-$,3/2$^-$	1301[c]		1803
664.18 *25*	1/2$^+$,3/2$^+$	1344.4 *5*	1/2$^{(-)}$,3/2$^{(-)}$	1823
667.0[@] *10*	5/2$^+$	1380.4[b] *4*	1/2$^+$,3/2$^+$	1838
678.3[#] *6*	1/2$^+$,3/2$^+$,5/2$^+$	1408.4[b] *3*	1/2$^+$,3/2$^+$	1864
697.0[#] *4*	5/2$^+$	1423.97 *18*	1/2$^-$,3/2$^-$	1873
720.57 *14*	1/2$^-$,3/2$^-$	1441		1883
734.41 *15*	1/2$^-$,3/2$^-$	1485		1889
758.28 *21*	1/2$^-$,3/2$^-$	1488		1896
833.6?[#] *9*	5/2$^+$	1493		1900
847.0[#] *4*	1/2$^+$,3/2$^+$	1508		1915
864.87 *10*	1/2$^-$,3/2$^-$	1527		1929
871.5[#] *4*	1/2$^+$,3/2$^+$	1550		1940
894.2[#] *7*	5/2$^+$	1563		1955
906.3[#] *5*	1/2$^+$,3/2$^+$	1567		1961
909.38 *24*	1/2$^-$,3/2$^-$	1579		1962
919.6[#] *6*	1/2$^+$,3/2$^+$	1588		1968
947.5[#] *9*	5/2$^+$,1/2$^+$,3/2$^+$	1622		1977
981.25 *20*	1/2$^+$,3/2$^+$	1634		1990
1033?[&]		1647		1999
1050.0 *5*	1/2$^+$,3/2$^+$	1651		2004
1068.2 *9*	1/2$^+$,3/2$^+$	1659		2039
1078.8 *4*	1/2$^+$,3/2$^+$,5/2$^+$	1667		2057
1085.0 *3*	1/2$^+$,3/2$^+$	1694		2061
1094.7[@] *4*	5/2$^+$	1696		2063
1108.82 *15*	1/2$^-$,3/2$^-$	1698		2069
1122.87 *11*	1/2$^-$,3/2$^-$	1712		2076
1128.0[a] *7*	5/2$^+$	1719		2079
1175.30 *23*	1/2$^-$,3/2$^-$	1727		2092
1183.07 *18*	1/2$^+$,3/2$^+$	1733		2101

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^{236}U(n,γ):resonance capture 1979Vo05,1972Ro09,1990Ma09 (continued)

^{237}U Levels (continued)

E(level)†	E(level)†	E(level)†	E(level)†
2108	2171	2244	2297
2133	2176	2255	2308
2136	2211	2263	(5126)
2139	2221	2274	
2148	2226	2282	
2154	2237	2294	

† Levels above 1424 are from 5-125-eV resonance capture gammas; E(level)≤1424 are averages of energies deduced from 2-keV, 24-keV, and 5-125-eV neutron capture gammas. Level energies are given as deduced in 1979Vo05.

‡ Deduced in 1979Vo05 from primary γ intensities. Transitions with I(reduced-2 keV)>40 were assumed to populate $1/2^-$, $3/2^-$ levels, with I(reduced-2 keV)<15 to populate $5/2^+$ levels. Transitions with I(reduced-2 keV)/I(reduced-24 keV)>1.5 were found in general to feed $1/2^-$, $3/2^-$ states.

Seen in 2- and 24-keV average resonance capture, not seen in 5-125 eV resonance capture.

@ Not observed in 5-125-eV resonance capture; listed as seen only in 24-keV average resonance capture.

& From 43.7-eV resonance capture; this level is not listed as observed in either 2^- or 24-keV resonance average spectrum.

a Not listed as observed in 2-keV resonance averaged spectrum.

b Not listed as observed in 24-keV resonance averaged spectrum.

c From 5.45-eV resonance capture; this level is not listed as observed in either 2^- or 24-keV resonance average spectrum.

γ(^{237}U)

Partial widths of primary gammas from neutron capture in eight (5-125 eV) resonances and relative reduced intensities of these transitions were deduced. The reduced intensities were defined as I(reduced)=C Iγ/Eγ^3, where C is a normalization factor.

Relative reduced intensities of primary gammas from average resonance neutron capture were also deduced. These intensities were normalized in such a way that Σ I(reduced 2-keV n)=Σ I(reduced 24-keV n) =Σ I(reduced 5-125-eV resonances)=1365.

See 1979Vo05 for listed experimental values of partial widths and reduced intensities.

See 1981Mc05 for deduced photon strength function for electric and magnetic dipole radiations by using slow neutron time-of-flight spectroscopy.

E_γ†	E_i(level)	E_f	E_γ†	E_i(level)	E_f	E_γ†	E_i(level)	E_f	E_γ†	E_i(level)	E_f
2818.7	(5126)	2308	3018.8	(5126)	2108	3198.0	(5126)	1929	3415.0	(5126)	1712
2829.8	(5126)	2297	3025.1	(5126)	2101	3212.0	(5126)	1915	3428.1	(5126)	1698
2832.4	(5126)	2294	3035.0	(5126)	2092	3226.2	(5126)	1900	3430.1	(5126)	1696
2844.8	(5126)	2282	3047.3	(5126)	2079	3230.2	(5126)	1896	3432.4	(5126)	1694
2852.7	(5126)	2274	3050.8	(5126)	2076	3237.9	(5126)	1889	3459.5	(5126)	1667
2863.9	(5126)	2263	3057.4	(5126)	2069	3243.2	(5126)	1883	3467.4	(5126)	1659
2872.0	(5126)	2255	3063.6	(5126)	2063	3253.3	(5126)	1873	3475.6	(5126)	1651
2883.0	(5126)	2244	3065.2	(5126)	2061	3262.7	(5126)	1864	3479.3	(5126)	1647
2889.1	(5126)	2237	3069.1	(5126)	2057	3288.6	(5126)	1838	3492.4	(5126)	1634
2900.5	(5126)	2226	3087.6	(5126)	2039	3303.3	(5126)	1823	3505.0	(5126)	1622
2905.4	(5126)	2221	3122.7	(5126)	2004	3323.6	(5126)	1803	3539.0	(5126)	1588
2915.5	(5126)	2211	3127.7	(5126)	1999	3328.8	(5126)	1798	3547.6	(5126)	1579
2950.7	(5126)	2176	3136.8	(5126)	1990	3367.0	(5126)	1760	3559.2	(5126)	1567
2955.8	(5126)	2171	3149.9	(5126)	1977	3369.1	(5126)	1757	3563.6	(5126)	1563
2972.4	(5126)	2154	3158.7	(5126)	1968	3371.4	(5126)	1755	3576.5	(5126)	1550
2978.7	(5126)	2148	3164.3	(5126)	1962	3388.5	(5126)	1738	3599.4	(5126)	1527
2987.8	(5126)	2139	3165.6	(5126)	1961	3393.9	(5126)	1733	3618.8	(5126)	1508
2990.2	(5126)	2136	3171.2	(5126)	1955	3399.2	(5126)	1727	3633.4	(5126)	1493
2993.9	(5126)	2133	3186.1	(5126)	1940	3407.7	(5126)	1719	3638.6	(5126)	1488

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^{236}U(n,γ):resonance capture 1979Vo05,1972Ro09,1990Ma09 (continued)

γ(^{237}U) (continued)

E_γ †	E_i(level)	E_f	J^π_f	E_γ †	E_i(level)	E_f	J^π_f
3642.0	(5126)	1485		4047.2	(5126)	1078.8	$1/2^+,3/2^+,5/2^+$
3685.5	(5126)	1441		4059.9	(5126)	1068.2	$1/2^+,3/2^+$
3702.3	(5126)	1423.97	$1/2^-,3/2^-$	4074.5	(5126)	1050.0	$1/2^+,3/2^+$
3718.2	(5126)	1408.4	$1/2^+,3/2^+$	4093.3#	(5126)	1033?	
3746.2	(5126)	1380.4	$1/2^+,3/2^+$	4145.3	(5126)	981.25	$1/2^+,3/2^+$
3780.4	(5126)	1344.4	$1/2^{(-)},3/2^{(-)}$	4217.4	(5126)	909.38	$1/2^-,3/2^-$
3825.8	(5126)	1301		4261.7	(5126)	864.87	$1/2^-,3/2^-$
3838.9	(5126)	1287.0	$1/2^+,3/2^+$	4368.1	(5126)	758.28	$1/2^-,3/2^-$
3862.7	(5126)	1268.8	$1/2^+,3/2^+,5/2^+$	4392.4	(5126)	734.41	$1/2^-,3/2^-$
3911.8‡#	(5126)	1215?		4405.7	(5126)	720.57	$1/2^-,3/2^-$
3924.9	(5126)	1201.42	$1/2^{(-)},3/2^{(-)}$	4461.9	(5126)	664.18	$1/2^+,3/2^+$
3943.6	(5126)	1183.07	$1/2^+,3/2^+$	4571.6	(5126)	554.91	$1/2^-,3/2^-$
3950.8	(5126)	1175.30	$1/2^-,3/2^-$	4586.1	(5126)	540.59	$1/2^-,3/2^-$
3999.0	(5126)	1128.0	$5/2^+$	4966.5	(5126)	159.7	$5/2^+$
4003.6	(5126)	1122.87	$1/2^-,3/2^-$	5115.2	(5126)	11.38	$1/2^+,3/2^+$
4018.0	(5126)	1108.82	$1/2^-,3/2^-$	5126.2	(5126)	0.07	$1/2^+,3/2^+$
4042.1	(5126)	1085.0	$1/2^+,3/2^+$				

† From neutron capture in 5-125-eV resonances (1979Vo05). Eγ<3700 keV (levels fed in primary gammas above 1424-keV level) were listed for 5-125-eV resonances, but not for the transitions from average resonance neutron capture.

‡ Not seen in either 2^- or 24-keV resonance average spectrum, hence must be regarded as doubtful (1979Vo05).

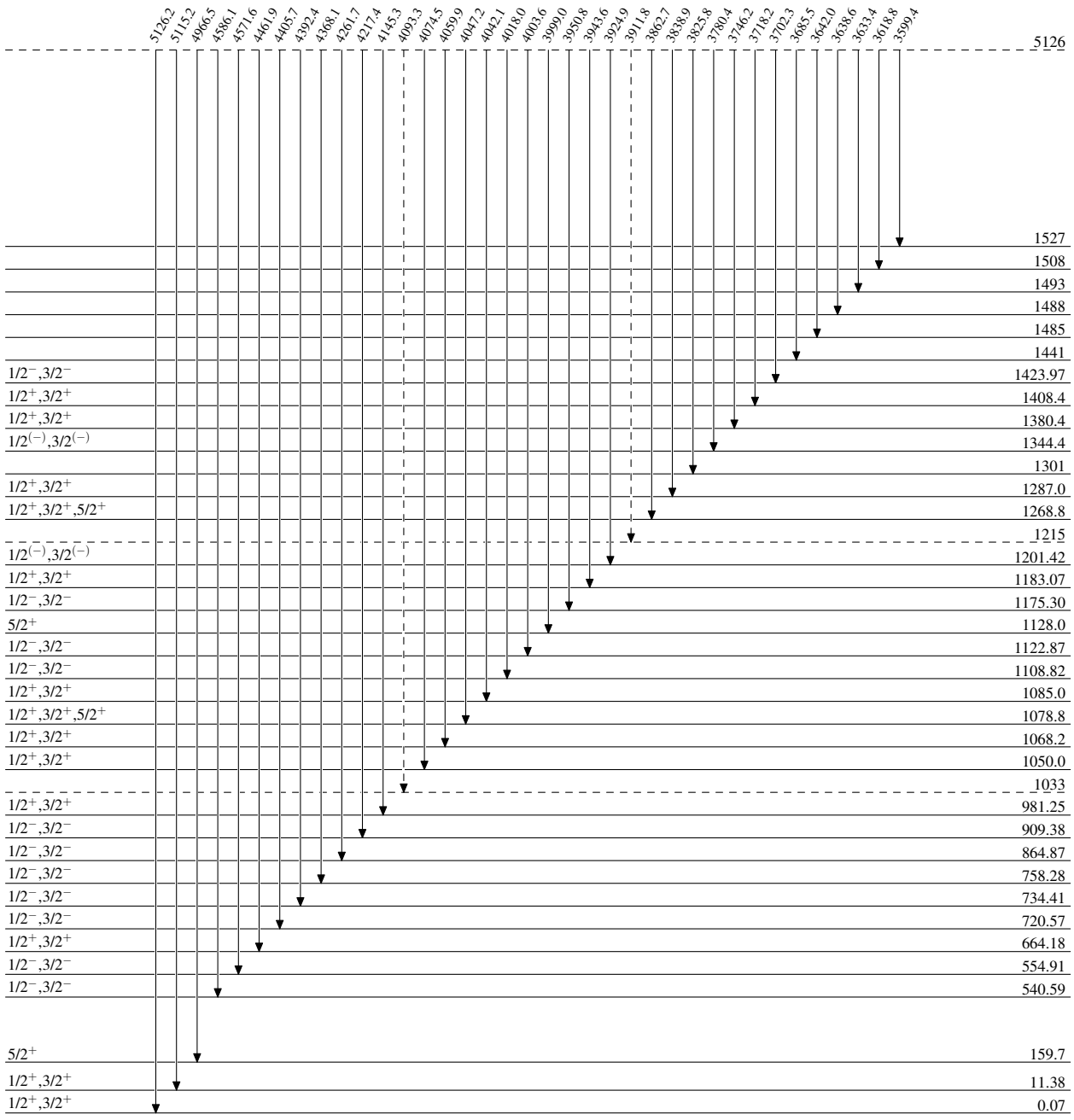
Placement of transition in the level scheme is uncertain.

Legend

^{236}U(n,γ):resonance capture 1979Vo05,1972Ro09,1990Ma09

Level Scheme

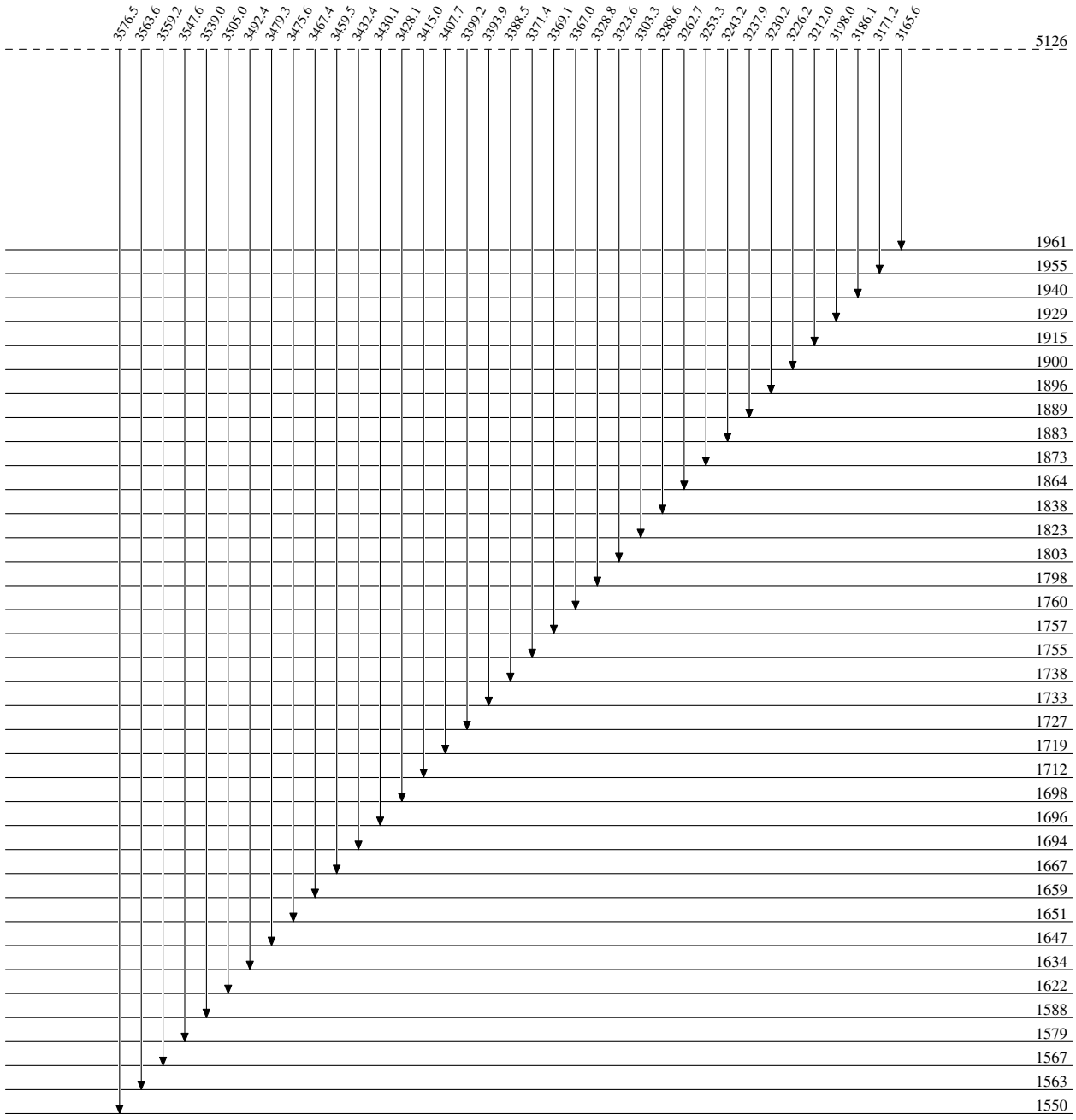
γ Decay (Uncertain)



$^{237}_{92}U_{145}$

^{236}U(n,γ):resonance capture 1979Vo05,1972Ro09,1990Ma09

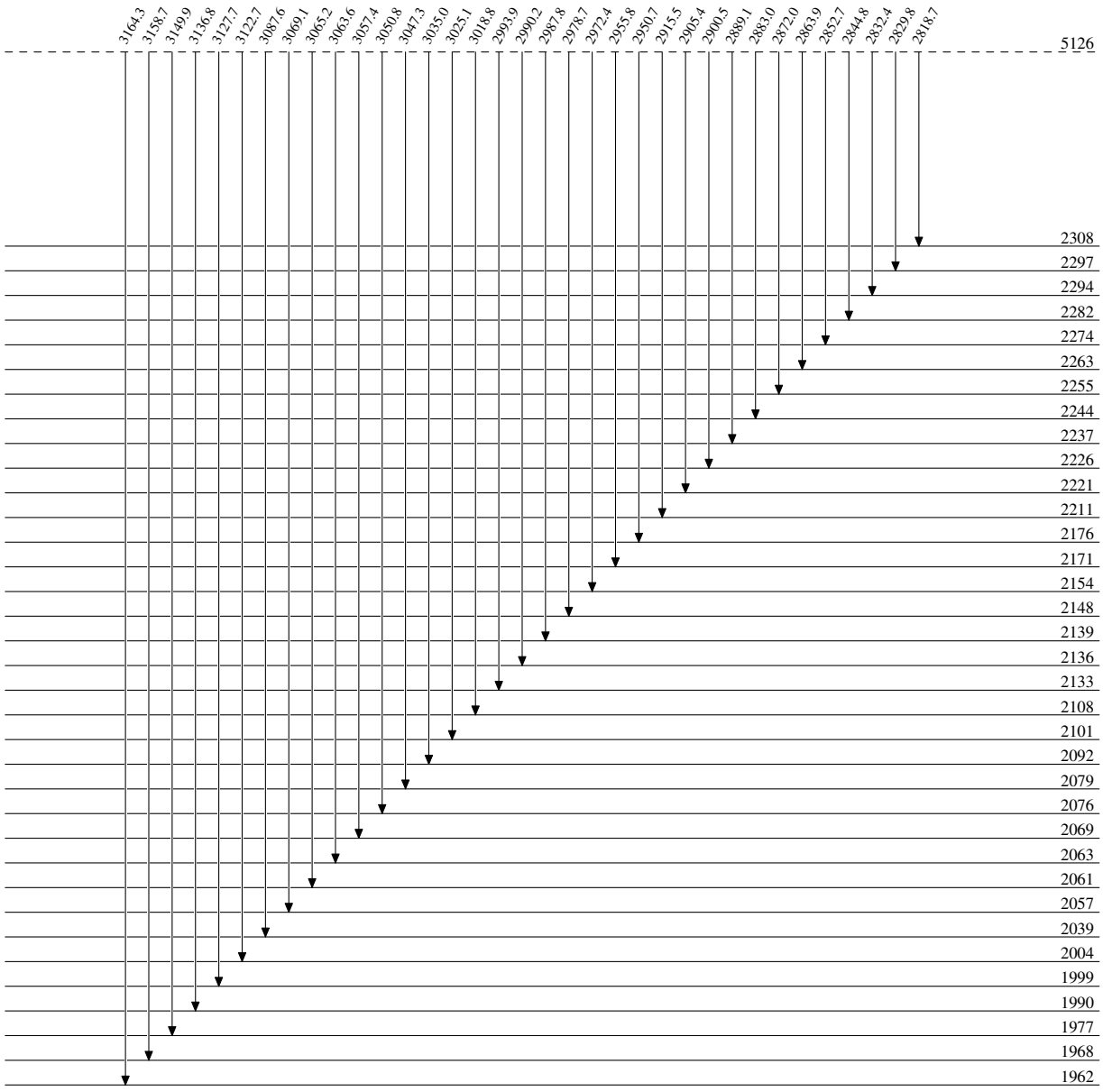
Level Scheme (continued)



$^{237}_{92}U_{145}$

^{236}U(n,γ):resonance capture 1979Vo05,1972Ro09,1990Ma09

Level Scheme (continued)



$^{237}_{92}U_{145}$