^{187}Re(^{136}Xe,Xγ) 2016Re02

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 195,368 (2024)	1-Dec-2023

Includes ^{186}W(^{136}Xe,Xγ) and ^{192}Os(^{136}Xe,Xγ).

Adapted/Edited the XUNDL dataset compiled by B. Singh (McMaster), Dec 7, 2015.

2016Re02: ^{136}Xe beam at E≈6 MeV/nucleon from ATLAS-ANL facility. Measured Eγ, Iγ, triple-fold $\gamma\gamma$-coin and (x ray)γ-coin, γ(t), $\gamma\gamma$(t), angular correlations using Gammasphere array. In-beam and out-of-beam experiments using pulsed beam. For investigation of longer-lived isomers, chopped beam was used. Deduced high-spin levels, J, π, bands, E2/M1 mixing ratios, configurations, 3qp-isomers.

As stated in 2016Re02 (see reference 29 in paper), details of this work would be published.

^{191}Re Levels

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$	Comments
145[#] *3*	9/2$^-$		E(level): from Adopted Levels. Additional information 1.
285.1[#]	11/2$^-$		
413.6[@]	11/2$^-$		
509.9[#]	13/2$^-$		
553.2[@]	13/2$^-$		
621.1[&]	(13/2$^-$)		J$^\pi$: γ to (11/2$^-$) and (9/2$^-$). Bandhead assignment in comparison with that in ^{187}Re and ^{189}Re (2016Re02).
644.8[#]	15/2$^-$		
883.1[&]	(15/2$^-$)		
889.5[@]	15/2$^-$		
952.8[#]	17/2$^-$		
977.1[@]	17/2$^-$		
1088.6[#]	19/2$^-$		
1349.8[@]	19/2$^-$		
1485.8[#]	21/2$^-$		
1507.6	21/2$^+$	70 ns *40*	T$_{1/2}$: from τ=101 ns *58* $\gamma\gamma$(t) (2016Re02).
1601.6	25/2$^-$	50.6 μs *35*	T$_{1/2}$: from τ=73 μs *5* (2016Re02) − γ(t).
1678.7	23/2$^+$	33.3 ns *28*	T$_{1/2}$: from τ=48 ns *4* (2016Re02) − γ(t).

[†] From least-squares fit to Eγ values, assuming equal uncertainty for all γ-ray energies.

[‡] From 2016Re02, based on multipolarities of γ transitions from $\gamma\gamma(\theta)$ and conversion coefficients deduced from intensity balance arguments, and band structures (2016Re02).

[#] Band(A): π9/2[514].

[@] Band(B): π11/2[505].

[&] Band(C): π9/2[514]⊗2+$_\gamma$.

γ(^{191}Re)

E$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[†]	α[@]	Comments
87.6	977.1	17/2$^-$	889.5	15/2$^-$			
93.8	1601.6	25/2$^-$	1507.6	21/2$^+$	(M2)	58.9 *8*	α(K)=40.1 *6*; α(L)=14.27 *20*; α(M)=3.57 *5* α(N)=0.874 *12*; α(O)=0.1425 *20*; α(P)=0.00871 *12*
115.9	1601.6	25/2$^-$	1485.8	21/2$^-$	(E2)	2.301 *32*	α(K)=0.642 *9*; α(L)=1.254 *18*; α(M)=0.318 *4* α(N)=0.0757 *11*; α(O)=0.01082 *15*; α(P)=5.47×10^{-5} *8*

Continued on next page (footnotes at end of table)

^{187}Re(^{136}Xe,Xγ) 2016Re02 (continued)

γ(^{191}Re) (continued)

E_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[‡]	α[@]	Comments
134.8	644.8	15/2$^-$	509.9	13/2$^-$	M1+E2[#]	0.17 *9*	2.18 *4*	α(K)=1.79 *5*; α(L)=0.302 *13*; α(M)=0.0695 *34* α(N)=0.0168 *8*; α(O)=0.00280 *10*; α(P)=0.000194 *6*
136.0	1088.6	19/2$^-$	952.8	17/2$^-$				
139.7	553.2	13/2$^-$	413.6	11/2$^-$				
140.0	285.1	11/2$^-$	145	9/2$^-$	M1+E2[#]	0.28 *+14−12*	1.92 *7*	α(K)=1.55 *10*; α(L)=0.282 *21*; α(M)=0.065 *6* α(N)=0.0158 *14*; α(O)=0.00260 *17*; α(P)=0.000168 *11* δ: From text in 2016Re02.
157.9	1507.6	21/2$^+$	1349.8	19/2$^-$	(E1)		0.1179 *17*	α(K)=0.0971 *14*; α(L)=0.01608 *23*; α(M)=0.00367 *5* α(N)=0.000878 *12*; α(O)=0.0001404 *20*; α(P)=7.93×10^{-6} *11*
171.1	1678.7	23/2$^+$	1507.6	21/2$^+$				
192.8	1678.7	23/2$^+$	1485.8	21/2$^-$	(E1)		0.0707 *10*	α(K)=0.0585 *8*; α(L)=0.00947 *13*; α(M)=0.002161 *30* α(N)=0.000518 *7*; α(O)=8.34×10^{-5} *12*; α(P)=4.91×10^{-6} *7*
224.9	509.9	13/2$^-$	285.1	11/2$^-$	M1+E2[#]	0.20 *10*	0.512 *15*	α(K)=0.423 *15*; α(L)=0.0691 *10*; α(M)=0.01585 *24* α(N)=0.00384 *6*; α(O)=0.000642 *9*; α(P)=4.57×10^{-5} *17*
261.7	1349.8	19/2$^-$	1088.6	19/2$^-$				
262.0	883.1	(15/2$^-$)	621.1	(13/2$^-$)				
267.6	553.2	13/2$^-$	285.1	11/2$^-$				
268.7	413.6	11/2$^-$	145	9/2$^-$				
307.9	952.8	17/2$^-$	644.8	15/2$^-$	M1+E2[#]	0.32 *+20−15*	0.209 *17*	α(K)=0.172 *16*; α(L)=0.0283 *11*; α(M)=0.00650 *21* α(N)=0.00157 *5*; α(O)=0.000263 *11*; α(P)=1.85×10^{-5} *18*
336.0	621.1	(13/2$^-$)	285.1	11/2$^-$				
336.0	889.5	15/2$^-$	553.2	13/2$^-$				
359.9	644.8	15/2$^-$	285.1	11/2$^-$	E2		0.0520 *7*	α(K)=0.0365 *5*; α(L)=0.01186 *17*; α(M)=0.00289 *4* α(N)=0.000691 *10*; α(O)=0.0001056 *15*; α(P)=3.50×10^{-6} *5* Mult.: A_2=0.054 *42*, A_4=0.071 *56* for 359.9γ-140.0γ cascade (data in Fig. 5).
364.9	509.9	13/2$^-$	145	9/2$^-$				
372.8	1349.8	19/2$^-$	977.1	17/2$^-$				
379.7	889.5	15/2$^-$	509.9	13/2$^-$				
396.8	1349.8	19/2$^-$	952.8	17/2$^-$				
397.0	1485.8	21/2$^-$	1088.6	19/2$^-$				
418.9	1507.6	21/2$^+$	1088.6	19/2$^-$	(E1)		0.01089 *15*	α(K)=0.00911 *13*; α(L)=0.001381 *19*; α(M)=0.000313 *4* α(N)=7.54×10^{-5} *11*; α(O)=1.243×10^{-5} *17*; α(P)=8.28×10^{-7} *12* Mult.: A_2=0.058 *35*, A_4=−0.015 *52* for 418.9γ-359.9γ cascade (data in Fig. 5).
423[&]	977.1	17/2$^-$	553.2	13/2$^-$				

Continued on next page (footnotes at end of table)

^{187}Re(^{136}Xe,Xγ) 2016Re02 (continued)

γ(^{191}Re) (continued)

E_γ	E_i(level)	J_i^π	E_f	J_f^π	E_γ	E_i(level)	J_i^π	E_f	J_f^π
442.9	952.8	$17/2^-$	509.9	$13/2^-$	476[&]	621.1	$(13/2^-)$	145	$9/2^-$
443.9	1088.6	$19/2^-$	644.8	$15/2^-$	476.0	889.5	$15/2^-$	413.6	$11/2^-$
460.1	1349.8	$19/2^-$	889.5	$15/2^-$	533.2	1485.8	$21/2^-$	952.8	$17/2^-$
466.8	1349.8	$19/2^-$	883.1	$(15/2^-)$					

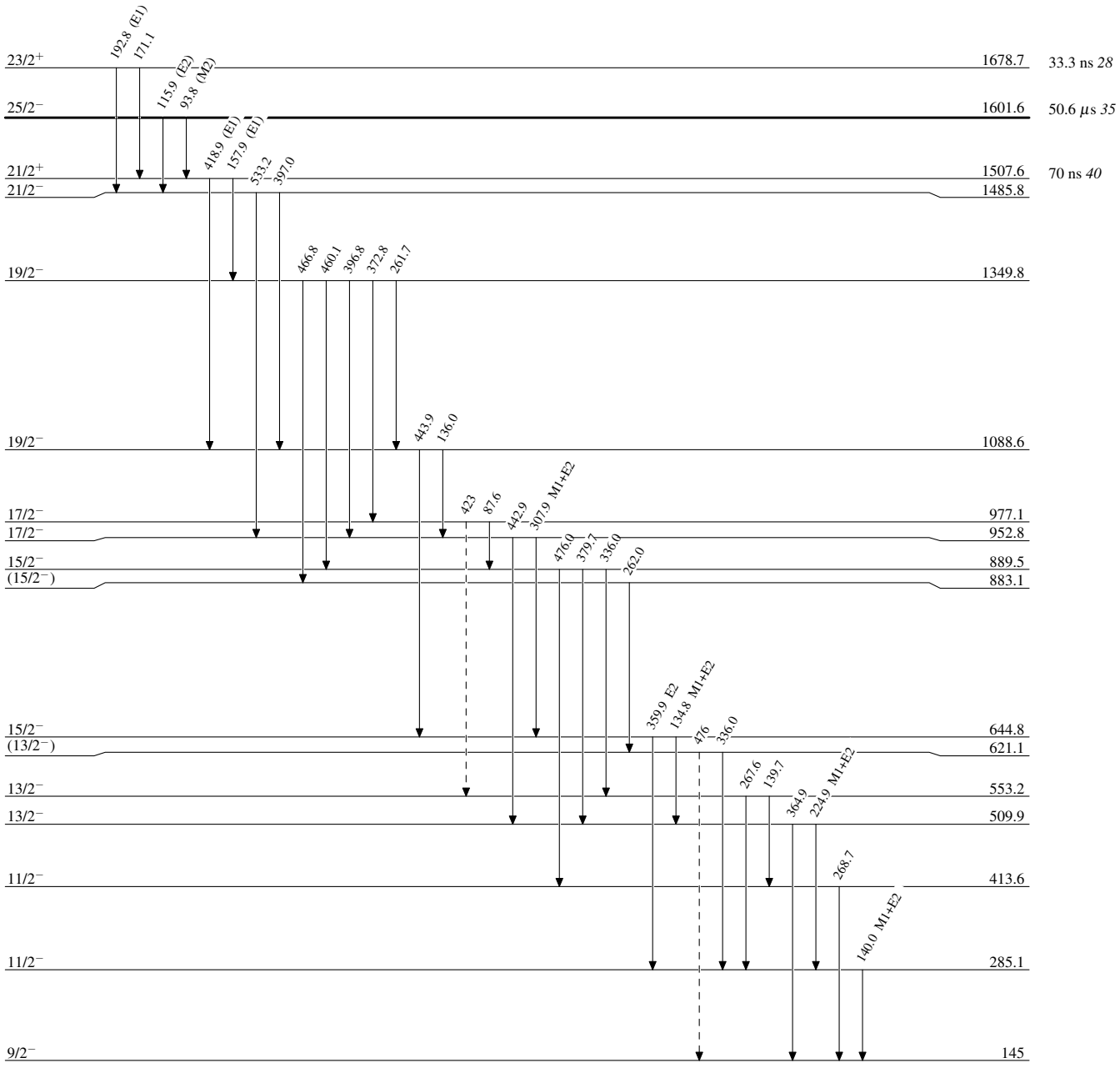
† From conversion coefficients deduced from intensity balances, except where noted.
‡ From γγ(θ) data. Values of mixing ratios estimated from plot shown in the right panel of Figure 6 in 2016Re02, except where noted.
# From γγ(θ) data in 2016Re02.
@ Additional information 2.
& Placement of transition in the level scheme is uncertain.

Legend

^{187}Re(^{136}Xe,Xγ) 2016Re02

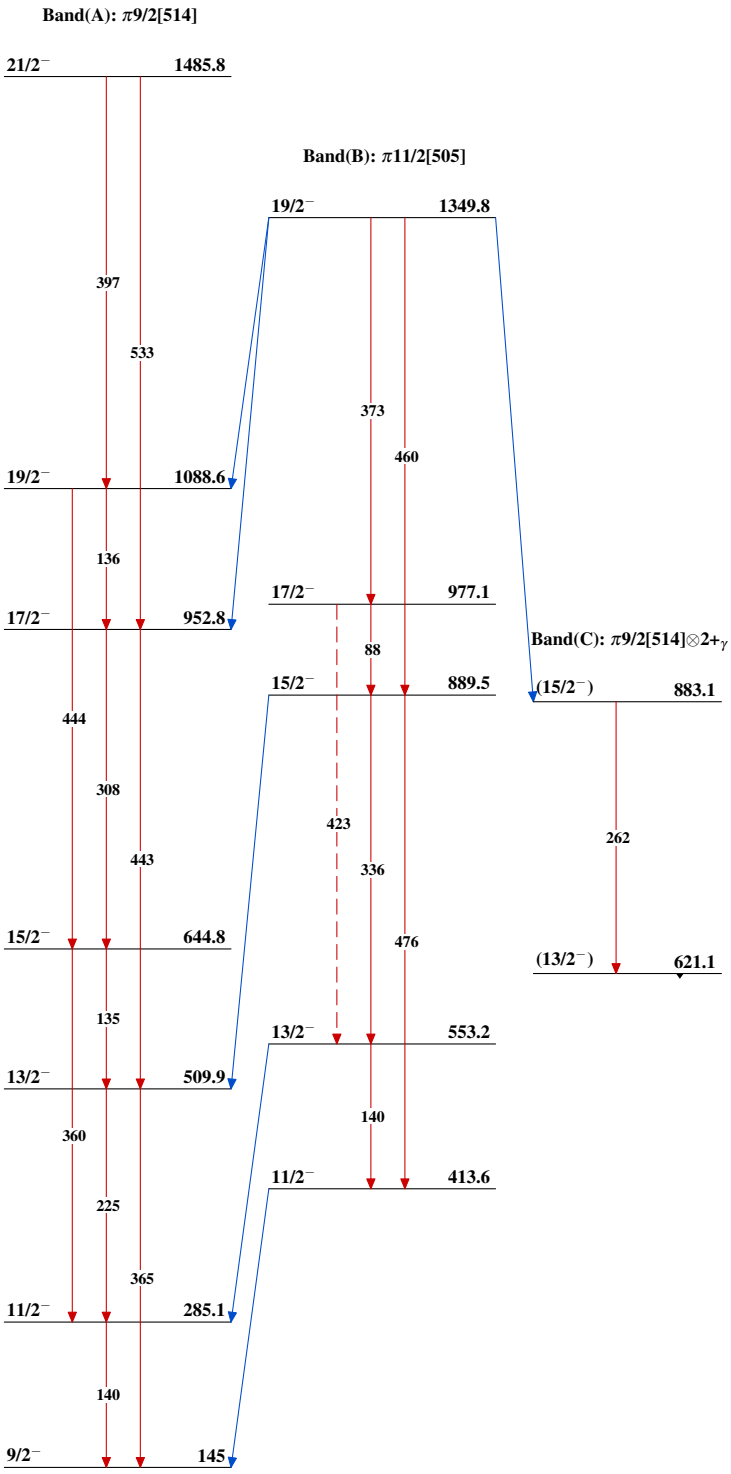
Level Scheme

γ Decay (Uncertain)



$^{191}_{75}Re_{116}$

^{187}Re(^{136}Xe,Xγ) 2016Re02



$^{191}_{75}Re_{116}$