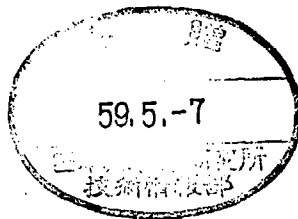


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Table of Members of Quasi-Bands

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## INTRODUCTION

Probable members of the quasi-bands in even-even nuclei for  $Z$  between 6 and 100 are listed in this table. The terms "quasi-ground band" "quasi-beta band", and "quasi-gamma band" have been introduced in the so-called spherical regions as counter-parts of the "collective bands" in the deformed regions.<sup>1</sup> These bands have the spin sequences  $0^+, 2^+, 4^+, \dots, 0^+, 2^+, 4^+, \dots$  and  $2^+, 3^+, 4^+, \dots$ , respectively, and tend gradually through the transition region to the ground-state rotational and beta- and gamma-vibrational bands in the deformed nuclei.

In the present compilation the data for deformed nuclei are classified for convenience under the same titles, Quasi-Ground Band, Quasi-Beta Band, and Quasi-Gamma Band, as are used for other nuclear regions. The nomenclature of beta and gamma used for the levels in light nuclei and in nuclei near the closed shells may be inadequate because the physical content of such bands is fairly different from those in the deformed regions. Nevertheless, we use these appellations to stress as persistency of the excited-level structure in deformed nuclei which shows up distinctively even in such nuclei.

Since 1967 a table of the present type has been made eleven times, 2-12. The last one was published in 1982. Since then, an enormous amount of experimental data has been accumulated. The present edition covered the literature through September 1983. Several important data which appeared after that date were also included. Fifteen newly discovered nuclides, namely,  $^{18}\text{C}_{12}$ ,  $^{152}\text{Ce}_{94}$ ,  $^{138}\text{Sm}_{76}$ ,  $^{146}\text{Dy}_{80}$ ,  $^{166}\text{Dy}_{100}$ ,  $^{148}\text{Er}_{80}$ ,  $^{150}\text{Er}_{82}$ ,  $^{152}\text{Yb}_{82}$ ,  $^{178}\text{Yb}_{108}$ ,  $^{162}\text{Hf}_{90}$ ,  $^{164}\text{Hf}_{92}$ ,  $^{168}\text{W}_{94}$ ,  $^{170}\text{W}_{94}$ ,  $^{218}\text{Ra}_{130}$  and  $^{222}\text{Th}_{132}$  were included. The assignment of a member was based on its location, on its spin and parity, and on the nuclear properties deduced from beta and gamma-ray spectroscopy, nuclear reactions especially Coulomb excitation, etc. There are certain levels which are not included in the table. These levels consist mainly of simple two quasi-particle states, negative-parity states except octupole-band states ( $K = 0^-$ ),  $1^+$  and  $4^+$  states, etc. The data without reference keys were taken from Refs. 13 and 14.

A notation of parentheses is used for the cases in which data are uncertain. In general an entry without parentheses denotes a level whose spin and parity are well-established. Spin-parity assignments based on the results of  $\gamma$ -ray angular-distrib-

tion measurements of transitions linking member states of yrast bands are also accepted as certain. The classification of energy levels into quasi-bands is made on the basis of systematic trends in data over large groups of nuclei. As all of the data necessary for proper classification are not always available, the quasi-band classification of particular levels is not rigorous.

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## EXPLANATION OF TABLE

The figures are the excitation energies in MeV of members of the quasi-bands. The notations in the second column C, g,  $\beta_1$  and  $\gamma_1$ , stand for the classification of the

quasi-ground, quasi-beta and quasi-gamma bands, respectively. If a nucleus has more than one  $\beta$  or  $\gamma$ , they are distinguished by  $i$ . The bands were listed up to  $i = 3$ . In the heading  $0^+$ ,  $2^+$ ,  $4^+$ , ... are the spin and parity for  $g$  and  $\beta$ , while  $(2^+)$ ,  $(3^+)$ ,  $(4^+)$ , ... for  $\gamma$ . In case a nucleus has members of more than  $18^+$  for  $g$  and  $\beta$  or members of more than  $11^+$  for  $\gamma$ , these higher spin members are listed in the second row by italic style. In the column R are listed the ratios such as  $E(4 \rightarrow 0)/E(2 \rightarrow 0)$  for  $g$  and  $\beta$  and  $E(4' \rightarrow 2')/E(3' \rightarrow 2')$  for  $\gamma$ . The meaning of  $1^-/3^-$  and  $3^-/7^-$  in the column of octupole band is to put the energies of  $1^-$  and  $3^-$  members in the first row and those of  $5^-$  and  $7^-$  members in the second row. Ref. is references which are grouped in the last part of the Table.



Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands											Octupole band			Ref.
	C	$0^+(2^+)$	$2^+(3^+)$	$4^+(4^+)$	$6^+(5^+)$	$8^+(6^+)$	$10^+(7^+)$	$12^+(8^+)$	$14^+(9^+)$	$16^+(10^+)$	$18^+(11^+)$	R	$1^-/5^-$	$3^-/7^-$	
$^{24}_{12}\text{Mg}_{12}$	g	0	1.36859	4.12282	8.113	13.20						3.012	7.553	8.3577	Mg-1
	$\beta_1$	6.4322	7.3479	9.30	12.86							3.13	10.026	12.450	
	$\gamma_1$	4.2384	5.2361	6.0103	7.812	9.528	(12.347)	14.152				1.776			
$^{24}_{12}\text{Mg}_{14}$	g	0	1.80868	4.9003	8.38	(13.19)						2.709	7.062	6.8777	Mg-2, Mg-3
	$\beta_1$	3.5883	4.3319	5.4739								2.536			
	$\beta_2$	4.9722	6.1252												
	$\gamma_1$	2.93836	4.3498	5.7155								1.968			
$^{28}_{12}\text{Mg}_{16}$	g	0	1.4734	4.0202								2.729	5.2717	5.1718	
	$\beta_1$	3.8627	4.5570												
	$\beta_2$	5.7023													
	$\gamma_1$	4.8786													
$^{30}_{12}\text{Mg}_{18}$	g	0	1.4842												Mg-4
$^{32}_{12}\text{Mg}_{20}$	g	0	0.8857												Mg-4
$^{28}_{14}\text{Si}_{12}$	g	0	1.7959	(3.756)								2.091			Si-1
	$\beta_1$	3.3325													
	$\gamma_1$	2.7835	(3.842)												
$^{28}_{14}\text{Si}_{14}$	g	0	1.77879	4.6173	8.5429	14.643						2.596	8.0937	6.8686	Si-2, Si-3 Si-4
	$\beta_1$	4.9791										3.587	9.7020		
	$\beta_2$	6.6914	7.3807	9.1639	11.509										
$^{30}_{14}\text{Si}_{16}$	g	0	2.23537	5.2795	(8.95)							2.364	6.7441	5.4875	Si-5
	$\beta_1$	3.7879	4.8092	5.9502								2.117	7.043		
	$\beta_2$	5.3720													
	$\gamma_1$	3.4987	4.8307												
$^{32}_{14}\text{Si}_{18}$	g	0	1.9614	(5.220)								2.689		5.2888	Si-6, Si-7
	$\beta_1$	4.983											6.195		
	$\gamma_1$	4.232													
$^{36}_{16}\text{S}_{14}$	g	0	2.2106	(5.136)								2.323		5.22	
	$\beta_1$	(3.668)													
	$\gamma_1$	3.4026													
$^{32}_{16}\text{S}_{16}$	g	0	2.2303	4.4589								1.999	5.7979	5.0062	
	$\beta_1$	3.7783	5.5489	7.964								2.354			
	$\gamma_1$	4.2815	5.4130	6.4110								1.882			
$^{34}_{16}\text{S}_{18}$	g	0	2.1273	4.6876	(7.392)							2.204		4.62	S-1
	$\beta_1$	3.9142	4.8893												
	$\gamma_1$	3.3032	4.8758	6.250								1.874			
$^{36}_{16}\text{S}_{20}$	g	0	3.2910	6.509								1.978		4.1925	
	$\beta_1$	3.346	4.5752												
$^{34}_{18}\text{Ar}_{16}$	g	0	2.0909											(4.5131)	
	$\beta_1$	3.871													
	$\beta_2$	4.967													
	$\gamma_1$	3.2875													
$^{36}_{18}\text{Ar}_{18}$	g	0	1.97039	4.41436								2.240	5.8360	4.17833	
	$\beta_1$	(4.3297)	4.9512										5.17114		
	$\gamma_1$	4.4405													
$^{36}_{18}\text{Ar}_{20}$	g	0	2.16759	5.3495	6.4082	8.5693	(11.290)					2.468	5.7339	3.81004	Ar-1
	$\beta_1$	3.37745	3.93665	5.3495	(7.288)	(9.338)						3.527	4.58586		
	$\beta_2$	4.7103	5.1573												
	$\gamma_1$	3.93665													
$^{40}_{18}\text{Ar}_{22}$	g	0	1.46081	2.89263	3.46448							1.980	4.0825	3.6808	Ar-2
	$\beta_1$	2.1208	2.5241	3.515	4.959	(6.806)						3.456	4.494		
	$\gamma_1$	3.2080													
$^{48}_{18}\text{Ar}_{24}$	g	0	1.2082	(2.415)								1.999		(4.396)	
	$\beta_1$	2.5125	3.5578												
	$\gamma_1$	2.4867													

Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands											Octupole band			Ref.
	C	0 <sup>+</sup> (2 <sup>+</sup> )	2 <sup>+</sup> (3 <sup>+</sup> )	4 <sup>+</sup> (4 <sup>+</sup> )	6 <sup>+</sup> (5 <sup>+</sup> )	8 <sup>+</sup> (6 <sup>+</sup> )	10 <sup>+</sup> (7 <sup>+</sup> )	12 <sup>+</sup> (8 <sup>+</sup> )	14 <sup>+</sup> (9 <sup>+</sup> )	16 <sup>+</sup> (10 <sup>+</sup> )	18 <sup>+</sup> (11 <sup>+</sup> )	R	1 <sup>-</sup> /5 <sup>-</sup>	3 <sup>-</sup> /7 <sup>-</sup>	
<sup>44</sup> <sub>18</sub> Ar <sub>26</sub>	g	0	(1.61)												Ar-3
	$\beta_1$	(0.75)													
<sup>38</sup> <sub>20</sub> Ca <sub>18</sub>	g	0	2.206											3.695	
	$\beta_1$	3.050	3.690												
<sup>40</sup> <sub>20</sub> Ca <sub>20</sub>	g												5.9033	3.7369	
	$\beta_1$	3.3521	3.9045	5.2788	6.9302	8.0989			3.488	4.492					
	$\beta_2$	5.2129	5.6296	6.5084					3.109						
	$\gamma_1$	5.2488	6.0291	6.5435					1.659						
<sup>42</sup> <sub>20</sub> Ca <sub>22</sub>	g	0	1.52461	2.75229	3.18933				1.825	3.886	3.4464	Ca-1			
	$\beta_1$	1.8373	2.4236	3.2539	(4.715)	(6.633)			2.416	4.0957					
	$\beta_2$	3.300	3.653												
	$\gamma_1$	3.391													
<sup>44</sup> <sub>20</sub> Ca <sub>24</sub>	g	0	1.15702	2.28311	3.28495	5.086			1.973	(3.66153)	3.30786	Ca-2, Ca-3			
	$\beta_1$	1.88351	2.65650	3.3572					1.906						
	$\beta_2$	(3.587)													
	$\gamma_1$	3.3013													
<sup>46</sup> <sub>20</sub> Ca <sub>26</sub>	g	0	1.3460	(2.5747)	(2.9739)				1.913		(3.6145)	Ca-4			
	$\beta_1$	2.423	(3.023)	(3.860)					2.395						
	$\beta_2$	4.758													
	$\beta_3$	5.317													
	$\gamma_1$	(3.640)													
<sup>48</sup> <sub>20</sub> Ca <sub>28</sub>	g	0	3.8323	4.5044					1.175		4.5073	Ca-5, Ca-6 Ca-7			
	$\beta_1$	4.284													
	$\beta_2$	(5.465)													
	$\gamma_1$	4.613													
<sup>50</sup> <sub>20</sub> Ca <sub>30</sub>	g	0	1.024								3.993	Ca-8			
	$\beta_1$	3.159													
	$\beta_2$	4.470													
	$\gamma_1$	2.999													
<sup>47</sup> <sub>27</sub> Ti <sub>20</sub>	g	0	1.5549	2.6764	3.0430				1.721	3.48		Ti-1			
	$\beta_1$	1.8542	2.3955												
	$\beta_2$	4.245													
<sup>44</sup> <sub>22</sub> Ti <sub>22</sub>	g	0	1.08299	2.45433	4.0153	(6.5086)	(7.671)	(8.040)	2.266	3.7559		Ti-2			
	$\beta_1$	1.9043	2.5306	3.366					2.334						
	$\beta_2$	4.605													
	$\gamma_1$	2.8862	(3.4153)	3.980					2.067						
<sup>46</sup> <sub>22</sub> Ti <sub>24</sub>	g	0	0.88925	2.00982	3.2988	4.8968	6.2417	8.2170	(10.039)	2.260	3.1680	3.0586	Ti-3, Ti-4		
	$\beta_1$	2.6113	3.2357												
	$\beta_2$	(3.5718)													
	$\gamma_1$	2.9622													
<sup>48</sup> <sub>22</sub> Ti <sub>26</sub>	g	0	0.9834	2.2951	3.3325	4.564	6.102	8.091	2.334		3.359	Ti-5, Ti-6			
	$\beta_1$	3.000	3.6181	4.3877					2.245						
	$\gamma_1$	2.4209	(3.2236)												
<sup>50</sup> <sub>22</sub> Ti <sub>28</sub>	g	0	1.5537	2.6748	3.1983				1.722		4.418	Ti-7			
	$\beta_1$	(3.870)	4.311	(4.804)					2.120						
	$\beta_2$	5.633													
<sup>52</sup> <sub>22</sub> Ti <sub>30</sub>	g	0	1.0471	2.317	(3.027)				2.213		3.447	Ti-8, Ti-9			
	$\gamma_1$	2.4279													
<sup>48</sup> <sub>24</sub> Cr <sub>24</sub>	g	0	0.7520	1.8583	3.4447	5.1872	(7.063)		2.471		4.067	Cr-1, Cr-2 Cr-3			
	$\beta_1$	(3.42)													
	$\beta_2$	(4.26)													
	$\gamma_1$	(3.61)													

Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands											Octupole band			Ref.
	C	$0^+(2^+)$	$2^+(3^+)$	$4^+(4^+)$	$6^+(5^+)$	$8^+(6^+)$	$10^+(7^+)$	$12^+(8^+)$	$14^+(9^+)$	$16^+(10^+)$	$18^+(11^+)$	R	$1^-/5^-$	$3^-/7^-$	
$^{50}_{24}\text{Cr}_{26}$	g	0	0.7833	1.8814	(3.1641)	(4.7435)	(6.3392)	(7.6109)				2.402		4.05	Cr-4, Cr-5
	$\beta_1$		(3.694)												
	$\beta_2$		4.74												
	$\beta_3$		5.71												
	$\gamma_1$		2.9245												
$^{52}_{24}\text{Cr}_{28}$	g	0	1.434082	2.369896	3.113795	(4.7507)						1.653		4.563	Cr-6, Cr-7
	$\beta_1$		2.647	3.1617											
	$\beta_2$		4.794												
	$\beta_3$		2.964776	3.47219											
	$\gamma_1$														
$^{54}_{24}\text{Cr}_{30}$	g	0	0.834861	1.82372	(3.2225)							2.187		(4.126)	Cr-8
	$\beta_1$		2.82943	3.43664											
	$\beta_2$		4.016												
	$\beta_3$		2.61954												
	$\gamma_1$														
$^{56}_{24}\text{Cr}_{32}$	g	0	1.0076	2.684								2.666		3.451	Cr-9
	$\beta_1$		2.328												
	$\beta_2$		3.897												
	$\beta_3$		1.832												
	$\gamma_1$														
$^{50}_{26}\text{Fe}_{24}$	g	0	0.81												Fe-1
	$\beta_1$		0.850	2.385								2.806		4.400	Fe-2
$^{52}_{26}\text{Fe}_{26}$	g	0	1.4077	2.5380	2.948							1.803		4.786	Fe-3
	$\beta_1$		2.564	2.9607	3.8359							3.206			
	$\beta_2$		4.29	4.58											
	$\beta_3$		3.1632	(4.0718)											
	$\gamma_1$														
$^{54}_{26}\text{Fe}_{28}$	g	0	0.84678	2.08508	3.7566	5.2553						2.462		4.505	Fe-4, Fe-5 Fe-6
	$\beta_1$		2.9417	3.3702											
	$\beta_2$		3.6070												
	$\beta_3$		2.6576	(3.4454)	(4.1200)							1.856			
	$\gamma_1$		2.9600	(3.8565)	(4.2980)							1.492			
$^{56}_{26}\text{Fe}_{30}$	g	0	0.810764	2.07652	3.597	(5.502)						2.561		(3.880)	Fe-7, Fe-8 Fe-9
	$\beta_1$		2.257												
	$\beta_2$		3.24387	3.6300	4.08248							2.172			
	$\beta_3$		1.674698	2.13389	2.60039	3.449	3.886	4.669	5.340	5.829		2.016			
	$\gamma_1$														
$^{60}_{26}\text{Fe}_{34}$	g	0	0.82364	2.1145								2.567			Fe-10
	$\beta_1$		(1.975)												
	$\gamma_1$		2.299	2.7923											
$^{62}_{26}\text{Fe}_{36}$	g	0	0.8768	(2.1758)								2.482			Fe-11
	$\beta_1$		(1.8199)	(3.6336)											
	$\gamma_1$		(2.0160)												
$^{58}_{28}\text{Ni}_{28}$	g	0	2.702	3.923	5.316							1.452			Ni-1
	$\beta_1$		3.952												
	$\beta_2$		5.002	5.351	(5.985)							2.817			
	$\beta_3$		6.644												
	$\gamma_1$														
$^{60}_{28}\text{Ni}_{30}$	g	0	1.45445	2.4595								1.691		4.47	Ni-2, Ni-3 Ni-4, Ni-5
	$\beta_1$		2.9428	3.2645	3.6206							2.107			
	$\beta_2$		3.5309												
	$\beta_3$		2.7757	(3.4208)											
	$\gamma_1$		3.0378	3.7746											
$^{64}_{28}\text{Ni}_{32}$	g	0	1.332517	2.505766	4.2649	6.8366	8.5206					1.881		4.045	Ni-3, Ni-5 Ni-6, Ni-7
	$\beta_1$		2.28490	3.12403											
	$\beta_2$		3.3183												
	$\beta_3$		3.5588												
	$\gamma_1$		2.15878	2.62602	3.11975	4.2653						2.057			

Nucleus	C	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands									R	Octupole band		Ref.			
		0 <sup>+(2<sup>+</sup>)</sup>	2 <sup>+(3<sup>+</sup>)</sup>	4 <sup>+(4<sup>+</sup>)</sup>	6 <sup>+(5<sup>+</sup>)</sup>	8 <sup>+(6<sup>+</sup>)</sup>	10 <sup>+(7<sup>+</sup>)</sup>	12 <sup>+(8<sup>+</sup>)</sup>	14 <sup>+(9<sup>+</sup>)</sup>	16 <sup>+(10<sup>+</sup>)</sup>		18 <sup>+(11<sup>+</sup>)</sup>	1 <sup>-</sup> /5 <sup>-</sup>		3 <sup>-</sup> /7 <sup>-</sup>		
<sup>87</sup> <sub>28</sub> Ni <sub>58</sub>	g	0	1.17291	2.33635	(4.01871)									1.992		3.7570	Ni-5, Ni-8
	$\beta_1$	2.024860															
	$\beta_2$	2.8912															
	$\beta_3$	(3.5185)															
	$\gamma_1$	2.30180															
<sup>64</sup> <sub>28</sub> Ni <sub>36</sub>	g	0	1.34579	2.608									1.938		3.560	Ni-9	
	$\beta_1$	(2.2772)															
	$\beta_2$	2.865															
<sup>68</sup> <sub>28</sub> Ni <sub>40</sub>	g	0	1.422	3.179									2.236		3.364	Ni-10	
	$\beta_1$	2.437	(3.219)														
	$\beta_2$	(2.664)															
	$\beta_3$	(2.965)															
	$\gamma_1$	2.900															
<sup>68</sup> <sub>28</sub> Ni <sub>40</sub>	g	0	2.20													Ni-11	
	$\beta_1$	1.77															
<sup>60</sup> <sub>30</sub> Zn <sub>30</sub>	g	0	1.0042	2.1936									2.184	(3.980)	(3.5043)	Zn-1	
	$\beta_1$	0	0.9540	2.1861	3.7076								2.292	(3.870)	(3.216)		
<sup>62</sup> <sub>30</sub> Zn <sub>32</sub>	$\beta_1$	2.330	(2.810)												(4.042)	Zn-2, Zn-3	
	$\gamma_1$	1.8047	2.3847	(2.7433)	3.586	4.347	(5.143)					1.618					
	$\beta_2$	2.60925															
<sup>64</sup> <sub>30</sub> Zn <sub>34</sub>	g	0	0.99154	2.30699	3.9937								2.330		2.99860	Zn-4	
	$\beta_1$	1.91034	2.7937														
	$\beta_2$	2.60925															
	$\gamma_1$	1.79942		2.73673		4.2371											
<sup>66</sup> <sub>30</sub> Zn <sub>36</sub>	g	0	1.03937	2.449	(4.182)	(5.206)	(6.291)	(7.516)					2.356		2.8303	Zn-5, Zn-6 Zn-7	
	$\beta_1$	2.37256	2.78039											(3.901)			
	$\beta_2$	3.10546															
	$\beta_3$	3.53192															
	$\gamma_1$	1.87299	(2.779)	3.080								1.332					
<sup>68</sup> <sub>30</sub> Zn <sub>38</sub>	g	0	1.07738	2.41739	3.6876	4.3969							2.244	(3.18417)	2.75070	Zn-8, Zn-9	
	$\beta_1$	1.65594	2.33843	2.95941									1.901				
	$\gamma_1$	1.88316	3.00924														
<sup>70</sup> <sub>30</sub> Zn <sub>40</sub>	g	0	0.88485	1.78648									2.021		2.8592	Zn-10	
	$\beta_1$	1.0507	1.95739														
	$\beta_2$	2.139															
	$\beta_3$	(3.324)															
	$\gamma_1$	(1.75926)															
<sup>72</sup> <sub>30</sub> Zn <sub>42</sub>	g	0	0.6524													Zn-11, Zn-12	
	$\beta_1$	1.4988	(2.6455)														
	$\beta_2$	2.476															
	$\gamma_1$	1.6573															
<sup>74</sup> <sub>30</sub> Zn <sub>44</sub>	g	0	0.65													Zn-13	
<sup>86</sup> <sub>32</sub> Ge <sub>54</sub>	g	0	0.9569	2.1737	(3.6555)	(5.3605)	(6.5048)						2.272		(2.7977)	Ge-1	
	$\gamma_1$	1.6929	2.4950	2.7256	(3.7365)								1.288	(3.6840)	(4.2054)		
<sup>82</sup> <sub>32</sub> Ge <sub>50</sub>	g	0	1.01604	2.26824	3.69643	4.83771	(5.96253)	(7.5598)					2.232		2.64920	Ge-2	
	$\beta_1$	1.75455	2.4567	3.18280									2.034	3.58248	4.45459		
	$\beta_2$	2.617															
	$\beta_3$	3.204															
	$\gamma_1$	1.77770	2.42894	(2.83239)									1.620				



Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands											Octupole band			Ref.
	C	$0^+(2^+)$	$2^+(3^+)$	$4^+(4^+)$	$6^+(5^+)$	$8^+(6^+)$	$10^+(7^+)$	$12^+(8^+)$	$14^+(9^+)$	$16^+(10^+)$	$18^+(11^+)$	R	$1^-/5^-$	$3^-/7^-$	
$^{70}_{32}\text{Ge}_{38}$	g	0	1.03921	2.15259	3.29648	4.2027						2.071	(3.3147)	2.56133	Ge-3,Ge-4
	$\beta_1$	1.21446	2.1580	3.0582								1.954	(3.4157)	3.9545	
	$\beta_2$	2.3071													
	$\beta_3$	2.8876													
$^{72}_{32}\text{Ge}_{40}$	g	0	0.83414	1.72842	2.77224	3.76064	3.8202					2.072	(2.94010)	2.51492	Ge-5
	$\beta_1$	0.69155											3.12913	3.78441	
	$\beta_2$	2.029													
	$\gamma_1$	1.46412	2.06505	2.45402	(3.08046)	(3.40199)						1.664			
$^{74}_{32}\text{Ge}_{42}$	g	0	0.59588	1.46374								2.456		2.53647	Ge-6,Ge-7
	$\beta_1$	1.48279	2.19800	3.049								2.190			
	$\beta_2$	2.228													
	$\beta_3$	2.755													
$^{76}_{32}\text{Ge}_{44}$	g	0	0.56292	1.41008								2.505		2.6924	Ge-8,Ge-9
	$\beta_1$	1.9111	(2.502)	(3.231)								2.234			
	$\beta_2$	2.901													
	$\gamma_1$	1.10845	(1.5394)	(2.01987)								2.115			
$^{78}_{32}\text{Ge}_{46}$	g	0	0.61935	1.57017								2.535		2.744	Ge-10,Ge-11 Ge-12
	$\beta_1$	1.5466	(2.43870)												
	$\beta_2$	3.350													
	$\gamma_1$	1.18651	(1.64458)												
$^{80}_{32}\text{Ge}_{48}$	g	0	0.65914	1.74261								2.644			Ge-13
	$\gamma_1$	1.57359													
$^{82}_{32}\text{Ge}_{50}$	g	0	1.34807	(2.2864)								1.6961			Ge-13
	$\beta_1$	(2.3331)													
	$\gamma_1$	2.2153													
$^{78}_{34}\text{Se}_{44}$	g	0	0.9454	2.0396	3.0042	4.0390						2.157		2.5192	Se-1,Se-2
	$\beta_1$	(2.0112)													
	$\gamma_1$	1.6013	1.989	2.3842		3.288						2.019			
$^{72}_{34}\text{Se}_{38}$	g	0	0.86208	1.63686	2.46677	3.4248	4.5043	(5.7097)	(7.0381)			1.899		2.40573	Se-3
	$\beta_1$	0.93722	1.31668	(1.87620)								2.475	2.843		
	$\gamma_1$	1.31668													
$^{74}_{34}\text{Se}_{40}$	g	0	0.6348	1.3632	2.2314	3.1984	(4.2563)	(5.4430)	(6.7353)	(8.118)		2.148		2.3496	Se-4
	$\beta_1$	0.8540	(1.8387)												
	$\gamma_1$	1.2691	1.8843	2.1081	2.6620	2.9868	(3.5254)		(4.4499)			1.364			
$^{76}_{34}\text{Se}_{42}$	g	0	0.5591	1.3307	2.2621	3.2693	4.2986	(5.4285)				2.380		2.4288	Se-5,Se-6
	$\beta_1$	1.12233	1.78764										2.8243	3.4410	
	$\gamma_1$	1.2159	1.6887	2.0255	2.4890	2.9756	(3.4315)		(4.4046)			1.712			
$^{78}_{34}\text{Se}_{44}$	g	0	0.61369	1.50246	2.5435	3.5809	(4.6235)	(5.7821)				2.448		2.5078	Se-7,Se-8 Se-9
	$\beta_1$	(1.49860)	(1.99598)										2.8901	3.5232	
	$\gamma_1$	1.3087	1.8540	2.1906	(2.7371)	3.1395	(3.7064)		(4.7134)			1.617			
$^{80}_{34}\text{Se}_{46}$	g	0	0.66641	(1.690)								2.536		(2.717)	Se-10
	$\beta_1$	1.47950	(1.96043)												
	$\gamma_1$	1.44950													
$^{82}_{34}\text{Se}_{48}$	g	0	0.6544	1.7343								2.650		(3.015)	Se-11,Se-12
	$\beta_1$	(1.4096)											(3.453)		
	$\gamma_1$	(1.7313)	(2.5499)												
$^{84}_{34}\text{Se}_{50}$	g	0	1.45511									1.962			Se-12,Se-13
	$\beta_1$	2.247	(2.984)	(3.693)											
$^{86}_{34}\text{Se}_{52}$	g	0	0.7041												Se-14
$^{76}_{36}\text{Kr}_{40}$	g	0	0.4563	1.0147	1.7835	2.7511	3.896	5.021	6.311	7.646	9.262	2.224			Kr-1
	$\beta_1$	11.257													
	$\gamma_1$	1.1797	1.679	1.9774								1.598			

Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands											Octupole band			Ref.
	C	0 <sup>+</sup> (2 <sup>+</sup> )	2 <sup>+</sup> (3 <sup>+</sup> )	4 <sup>+</sup> (4 <sup>+</sup> )	6 <sup>+</sup> (5 <sup>+</sup> )	8 <sup>+</sup> (6 <sup>+</sup> )	10 <sup>+</sup> (7 <sup>+</sup> )	12 <sup>+</sup> (8 <sup>+</sup> )	14 <sup>+</sup> (9 <sup>+</sup> )	16 <sup>+</sup> (10 <sup>+</sup> )	18 <sup>+</sup> (11 <sup>+</sup> )	R	1 <sup>-</sup> /5 <sup>-</sup>	3 <sup>-</sup> /7 <sup>-</sup>	
<sup>78</sup> <sub>36</sub> Kr <sub>42</sub>	g	0	0.4242	1.0350	1.8590	2.880	(4.068)	(5.346)				2.440	2.260	Kr-2,Kr-3	
	$\beta_1$	0.7703	1.6877										2.684	3.288	
	$\tau_1$	1.2219	1.7335	1.957	2.452	2.763	3.332	(3.570)	(4.403)			1.437			
<sup>78</sup> <sub>36</sub> Kr <sub>42</sub>	g	0	0.45497	1.11948	1.97782	2.99327	4.1059	(5.2179)	(6.4806)	(7.938)		2.460	2.39902	Kr-4,Kr-5	
	$\beta_1$	1.01720	(1.75586)										2.74978	3.28793	
	$\tau_1$	1.14791	1.56475	1.87290	2.2995	(2.73154)	(3.2023)	(3.7665)	(4.2547)	(4.8583)		1.739			
<sup>80</sup> <sub>36</sub> Kr <sub>44</sub>	g	0	0.61660	1.43602	2.39183	3.4096	(4.3771)	(5.4366)	(6.677)			2.329	2.43903	Kr-6	
	$\beta_1$	(1.3205)											2.85941	3.58150	
	$\tau_1$	1.25622	1.78794	2.14576	2.65947	(3.10996)	(3.63518)	(4.1530)			1.673				
<sup>82</sup> <sub>36</sub> Kr <sub>46</sub>	g	0	0.77652	1.8205	2.9195	3.4615	4.6093	5.992				2.344	2.55618	Kr-7,Kr-8	
	$\beta_1$	1.4877	(1.9567)										2.8280	3.4964	
	$\beta_2$	2.17165	(2.6558)												
	$\tau_1$	1.47484	2.09393	2.42692	(3.1868)						1.538				
<sup>84</sup> <sub>36</sub> Kr <sub>48</sub>	g	0	0.88156	2.09490	3.1739	3.2342						2.376	(3.47568)	2.69982	Kr-10
	$\beta_1$	1.8373													
	$\tau_1$	1.89752	(3.08195)												
<sup>86</sup> <sub>36</sub> Kr <sub>50</sub>	g	0	1.56487	2.249								1.437	3.09928	Kr-11	
	$\beta_1$	2.724													
	$\beta_2$	3.540													
	$\beta_3$	3.832													
	$\tau_1$	2.34973													
<sup>88</sup> <sub>36</sub> Kr <sub>52</sub>	g	0	0.7753	(1.654)								2.133	(2.115)	Kr-12	
	$\beta_1$	2.789													
	$\tau_1$	1.5775													
<sup>90</sup> <sub>36</sub> Kr <sub>54</sub>	g	0	0.7071	(1.8304)								2.589		Kr-13	
	$\tau_1$	1.3623	(1.9403)	(2.3180)							1.653				
<sup>92</sup> <sub>36</sub> Kr <sub>56</sub>	g	0	(0.956)											Kr-14	
<sup>78</sup> <sub>38</sub> Sr <sub>40</sub>	g	0	0.278	0.781	1.495	2.385	3.439					2.809		Sr-1	
<sup>80</sup> <sub>38</sub> Sr <sub>42</sub>	g	0	0.38582	0.98083	1.7637	2.7009	3.7655	3.9435	6.262	7.729		2.545		Sr-1,Sr-2	
	$\beta_1$	1.000												Sr-3	
	$\tau_1$	1.14030	1.57107	1.83287							1.607				
<sup>82</sup> <sub>38</sub> Sr <sub>44</sub>	g	0	0.5736	1.3285	(2.2292)	(3.2426)	(4.3502)					2.316	(2.405)	Sr-4,Sr-5	
	$\beta_1$	1.310	1.865											Sr-6	
	$\tau_1$	1.1757	1.6866	1.9959	2.526	2.8363	(3.477)	3.6224		4.4234	1.605				
	$\tau_2$	(5.4264)		(6.5424)											
<sup>84</sup> <sub>38</sub> Sr <sub>46</sub>	g	0	0.7932	1.7677	2.8078	3.6802	4.5344	5.6532	6.7396			2.229	2.4481	Sr-7,Sr-8	
	$\beta_1$	1.503	2.390	(3.045)								1.738	2.7691	3.4880	
	$\beta_2$	2.075	2.880												
	$\beta_3$	(2.525)													
	$\tau_1$	1.4539	2.0563	2.2980	2.7356						1.401				
<sup>86</sup> <sub>38</sub> Sr <sub>48</sub>	g	0	1.07676	2.22989	2.85688	2.9555	(4.7099)	(6.0649)				2.071	2.48202	Sr-9,Sr-10	
	$\beta_1$	2.102	(2.64227)	(3.36217)							2.334	2.67298		Sr-11	
	$\beta_2$	2.99													
	$\tau_1$	1.85426													
<sup>88</sup> <sub>38</sub> Sr <sub>50</sub>	g	0	1.836035										2.734060	Sr-12	
	$\beta_1$	3.151	4.0355	(5.470)							2.622				
	$\beta_2$	4.484	5.165												
	$\beta_3$	4.763													
	$\tau_1$	3.21849	3.63444	(3.9526)							1.765				
<sup>90</sup> <sub>38</sub> Sr <sub>52</sub>	g	0	0.83168	1.65591								1.991		Sr-13	
	$\beta_1$	(2.6740)													
	$\beta_2$	2.97107													
	$\tau_1$	1.89235	(2.52791)	(2.92770)							1.629				

Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands											Ocupole band			Ref.
	C	$0^+(2^+)$	$2^+(3^+)$	$4^+(4^+)$	$6^+(5^+)$	$8^+(6^+)$	$10^+(7^+)$	$12^+(8^+)$	$14^+(9^+)$	$16^+(10^+)$	$18^+(11^+)$	R	$1^-/5^-$	$3^-/7^-$	
$^{92}_{38}\text{Sr}_{54}$	g	0	0.8147												Sr-14, Sr-15
	$\beta_1$	2.088													
	$\beta_2$	2.527													
	$\gamma_1$	1.3845													
$^{94}_{38}\text{Sr}_{56}$	g	0	0.8369	2.1459								2.564		1.9263	Sr-16
	$\beta_1$	(1.682)													
	$\beta_2$	(2.055)													
	$\gamma_1$	(2.2713)	2.6497												
$^{96}_{38}\text{Sr}_{58}$	g	0	0.8150	1.7928								2.200			Sr-16, Sr-17
	$\beta_1$	1.2293	1.6282												
	$\beta_2$	1.4650													
	$\gamma_1$	1.5068	(1.8522)												
$^{99}_{38}\text{Sr}_{60}$	g	0	0.1446	0.4339	(0.8675)							3.001			Sr-18, Sr-19
	$\beta_1$	0.2155	0.8709												
	$\gamma_1$	(1.600)													
$^{100}_{38}\text{Sr}_{62}$	g	0	0.1292	0.4176								3.232			Sr-20
$^{82}_{40}\text{Zr}_{42}$	g	0	0.407	1.040	1.887	2.900						2.555			Zr-1
$^{84}_{40}\text{Zr}_{44}$	g	0	0.5400	1.2628	2.136	3.088	4.067	5.133	6.298	7.541		2.339			Zr-1
$^{86}_{40}\text{Zr}_{46}$	g	0	0.7519	1.6666	2.6701	3.2984	(4.3258)	(5.3959)	(6.3206)			2.216		(2.3433)	Zr-2, Zr-3
	$\gamma_1$	1.4220	2.0421	(2.5663)								1.845		(3.4229)	
$^{88}_{40}\text{Zr}_{48}$	g	0	1.0573	2.1401	2.8116	3.3915	4.4144	(5.2314)				2.024		(2.456)	Zr-4, Zr-5
	$\beta_1$	1.520												(2.8014)	
	$\beta_2$	2.225													
	$\gamma_1$	1.8177													
$^{90}_{40}\text{Zr}_{50}$	g	0	2.18650	3.07722	3.44829	3.58944						1.407		2.7479	Zr-6
	$\beta_1$	1.7607	3.3087											3.9755	
	$\beta_2$	4.125													
	$\gamma_1$	3.84 <sup>2</sup>													
$^{92}_{40}\text{Zr}_{52}$	g	0	0.9341	1.4948	2.957	3.308	(4.297)	(4.948)	(6.047)	(7.448)		1.600		2.3390	Zr-7, Zr-8 Zr-9
	$\beta_1$	1.3819	1.8464	(2.3980)								2.188			
	$\gamma_1$	2.0661		2.8636											
$^{94}_{40}\text{Zr}_{54}$	g	0	0.9183	1.4688								1.599		2.0566	Zr-9, Zr-10
	$\beta_1$	1.2997	1.6712	2.3290								2.771		2.6037	
	$\gamma_1$	2.1503	(2.5076)												
$^{96}_{40}\text{Zr}_{56}$	g	0	1.7507	3.1202								1.782		1.8975	Zr-11
	$\beta_1$	1.594												(3.0825)	
$^{98}_{40}\text{Zr}_{58}$	g	0	1.2228	2.0476								1.675		1.8061	Zr-12, Zr-13
	$\beta_1$	0.8530	1.5904											(2.800)	
	$\beta_2$	1.4359													
	$\gamma_1$	1.8590													
$^{100}_{40}\text{Zr}_{60}$	g	0	0.2127	0.5648	1.0627							2.655			Zr-14, Zr-15
	$\beta_1$	0.3313	0.8785												
$^{102}_{40}\text{Zr}_{62}$	g	0	0.1519	0.4784	(0.9644)	(1.545)						3.149			Zr-16
$^{98}_{42}\text{Mo}_{56}$	g	0	0.932	1.936								2.077			Mo-1
$^{99}_{42}\text{Mo}_{57}$	g	0	0.9483	2.0027	2.8126	3.1071	(4.0801)	(4.5572)				2.112		2.4361	Mo-2, Mo-3
	$\beta_1$	1.979	2.613											2.8600	
	$\beta_2$	2.450												3.3683	
	$\gamma_1$	1.896													

Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands											Octupole band		Ref.	
	C	0 <sup>+</sup> (2 <sup>+</sup> )	2 <sup>+</sup> (3 <sup>+</sup> )	4 <sup>+</sup> (4 <sup>+</sup> )	6 <sup>+</sup> (5 <sup>+</sup> )	8 <sup>+</sup> (6 <sup>+</sup> )	10 <sup>+</sup> (7 <sup>+</sup> )	12 <sup>+</sup> (8 <sup>+</sup> )	14 <sup>+</sup> (9 <sup>+</sup> )	16 <sup>+</sup> (10 <sup>+</sup> )	18 <sup>+</sup> (11 <sup>+</sup> )	R	1 <sup>-</sup> /5 <sup>-</sup>		3 <sup>-</sup> /7 <sup>-</sup>
<sup>92</sup> <sub>42</sub> Mo <sub>50</sub>	g	0	1.50948	2.28262	2.61245	2.7604	5.1176	5.8580				1.512		2.84970 3.00705 (3.62477)	Mo-4
	$\beta_1$	2.51941													
	$\beta_2$	3.8412													
	$\gamma_1$	3.09133													
<sup>94</sup> <sub>42</sub> Mo <sub>52</sub>	g	0	0.871099	1.573726	2.42337	(2.9555)	(3.894)					1.807		2.5337	Mo-5, Mo-6 Mo-7
	$\beta_1$	1.740	2.0674	2.570								2.535			
	$\gamma_1$	1.8642													
<sup>96</sup> <sub>42</sub> Mo <sub>54</sub>	g	0	0.778213	1.62815	2.44064	2.97884	(3.7874)					2.092		2.23458	Mo-8
	$\beta_1$	(1.14786)	1.49773	1.86953								2.062			
	$\gamma_1$	1.62594	1.97825	2.21934	2.43835							1.684			
<sup>98</sup> <sub>42</sub> Mo <sub>56</sub>	g	0	0.78742	1.51013	2.3438	3.001						1.918		2.0176	Mo-9
	$\beta_1$	0.7349	1.43232	2.2240								2.135			
	$\beta_2$	1.964													
	$\gamma_1$	1.7585													
<sup>100</sup> <sub>42</sub> Mo <sub>58</sub>	g	0	0.53555	1.13594								2.121	2.08678	1.90821	Mo-10
	$\beta_1$	0.69510	1.06378												
	$\beta_2$	1.50461	2.2865												
	$\beta_3$	(2.0380)													
	$\gamma_1$	1.46389	(2.1032)												
<sup>102</sup> <sub>42</sub> Mo <sub>60</sub>	g	0	0.296611	0.74381	(1.32801)	(1.9836)						2.508		1.881	Mo-11
	$\beta_1$	0.698204	0.84215												
	$\beta_2$	1.334													
	$\gamma_1$	1.2457													
<sup>104</sup> <sub>42</sub> Mo <sub>62</sub>	g	0	0.1922	0.5606	(1.0798)							2.917			Mo-12
	$\beta_1$	0.8861	1.2147												
	$\gamma_1$	(0.8124)	(1.0285)												
<sup>106</sup> <sub>42</sub> Mo <sub>64</sub>	g	0	0.1716	0.5223	1.0685							3.044			Mo-13
	$\beta_1$	(0.9566)													
	$\gamma_1$	(0.7108)	(0.8856)												
<sup>94</sup> <sub>44</sub> Ru <sub>50</sub>	g	0	1.4306	2.1868	2.4985	2.6446	3.9918	4.7171				1.529		2.965	Ru-1, Ru-2
	$\beta_1$	2.995													
	$\beta_2$	3.615													
	$\gamma_1$	(2.510)													
<sup>96</sup> <sub>44</sub> Ru <sub>52</sub>	g	0	0.83260	1.51797	2.14960	2.95034	(3.8170)	(4.2634)				1.823		(2.5885)	Ru-3
	$\beta_1$	(2.1487)													
	$\gamma_1$	(1.93109)													
<sup>98</sup> <sub>44</sub> Ru <sub>54</sub>	g	0	0.65241	1.3978	2.2227	3.1267	(4.002)	(4.915)				2.14J		(2.435)	Ru-4, Ru-5
	$\beta_1$	(1.3208)												(2.657)	(3.284)
	$\gamma_1$	1.4149	2.014	2.267								1.422			
<sup>100</sup> <sub>44</sub> Ru <sub>56</sub>	g	0	0.53959	1.2265	2.0777	(3.0629)	(4.0870)	(5.131)				2.273	2.0993	2.1670	Ru-6, Ru-7
	$\beta_1$	1.13042	(1.8652)										2.5274		
	$\beta_2$	1.7419													
	$\beta_3$	2.0530													
	$\gamma_1$	1.3623	1.8814	2.0629	(2.5922)							1.350			
<sup>102</sup> <sub>44</sub> Ru <sub>58</sub>	g	0	0.47509	1.10637	1.87323	2.7038	(3.431)	(4.052)	(4.803)	(5.615)	(6.546)	2.329		2.04391	Ru-8, Ru-9
	$\beta_1$	0.94369	1.58057											(2.3710)	(2.703)
	$\beta_2$	1.83710													
	$\gamma_1$	1.10316	1.52168	(1.79874)	2.21911	2.5849						1.662			
<sup>104</sup> <sub>44</sub> Ru <sub>60</sub>	g	0	0.35799	0.8885	1.5563	2.3203						2.482		1.9704	Ru-10
	$\beta_1$	0.9883	1.5154											(2.2851)	
	$\beta_2$	(1.3352)													
	$\beta_3$	(1.8739)													
	$\gamma_1$	0.8931	1.2424	1.5026	1.8724	2.1968	(2.6083)	2.9885				1.745			

Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands											Octupole band		Ref.	
	C	$0^+(2^+)$	$2^+(3^+)$	$4^+(4^+)$	$6^+(5^+)$	$8^+(6^+)$	$10^+(7^+)$	$12^+(8^+)$	$14^+(9^+)$	$16^+(10^+)$	$18^+(11^+)$	R	$1^-/5^-$		$3^-/7^-$
$^{106}_{44}\text{Ru}_{62}$	g	0	0.270007	0.7148	(1.2959)	(1.9735)						2.647			Ru-11,Ru-12
	$\beta_1$	0.9906	1.3922												
	$\gamma_1$	0.7923	1.0916												
	g	0	0.24224	0.6652								2.746			
$^{108}_{44}\text{Ru}_{64}$	g	0	(1.0924)									2.746			Ru-11,Ru-13
	$\beta_1$	0.70782	(0.9748)												
	$\gamma_1$														
$^{110}_{44}\text{Ru}_{66}$	g	0	0.2408	0.6639	1.2400	1.9477						2.757			Ru-14
$^{112}_{44}\text{Ru}_{68}$	g	0	0.2368	0.6457								2.727			Ru-14
$^{96}_{46}\text{Pd}_{50}$	g	0	1.4154	2.0992	2.4243	2.5308	3.7839	4.5739				1.483			Pd-1
$^{98}_{46}\text{Pd}_{52}$	g	0	0.8631	1.5416	2.1127	2.7731						1.786			Pd-1
$^{100}_{46}\text{Pd}_{54}$	g	0	0.6653	1.4158	2.1888	2.9874	3.8688	4.7608	5.7062			2.128			Pd-2,Pd-3
	$\gamma_1$	1.5879	(2.3598)												
$^{102}_{46}\text{Pd}_{56}$	g	0	0.55653	1.27604	2.11152	3.01323	3.99290	5.05531	6.13885			2.293	2.342		Pd-4
	$\beta_1$	1.59301	1.94438	(2.34301)							2.135	2.47447	3.1879		
	$\beta_2$	1.6582													
	$\gamma_1$	1.53457	2.11178	(2.30136)								1.328			
$^{104}_{46}\text{Pd}_{58}$	g	0	0.51862	1.2292	2.0766	2.9625	3.5330	4.0882	(4.8933)	(5.8943)		2.381	(2.1918)		Pd-5,Pd-6
	$\beta_1$	1.33358	(1.79383)	2.26531							2.024	2.4914	2.9884		
	$\beta_2$	1.79286													
	$\gamma_1$	1.34168	1.82065	2.08238								1.546			
$^{106}_{46}\text{Pd}_{60}$	g	0	0.511862	1.2292	2.0766	2.9625	3.5330	4.0882	(4.8933)	(5.8943)		2.402	2.08432		Pd-5,Pd-7
	$\beta_1$	1.1337	1.5622	2.0774							2.202	2.3973	2.7936		
	$\beta_2$	1.7065													
	$\gamma_1$	1.12802	1.5577	1.9323	2.3520							1.872			
$^{108}_{46}\text{Pd}_{62}$	g	0	0.433938	1.048221	1.771161							2.416	2.0466		Pd-8
	$\beta_1$	1.05278	1.44118	(1.98985)							2.412				
	$\beta_2$	1.31421													
	$\gamma_1$	0.93120	(1.33520)	(1.6251)								1.718			
$^{110}_{46}\text{Pd}_{64}$	g	0	0.3738	-0.9208	1.5739	2.2958	3.1319	4.1453				2.463	2.1252	2.0376	Pd-9,Pd-10
	$\beta_1$	0.9467	1.2145	1.7175							2.878				
	$\beta_2$	1.1707	1.4701												
	$\gamma_1$	0.8136	1.2124	1.3980		2.0607		2.7751				1.465			
$^{112}_{46}\text{Pd}_{66}$	g	0	0.34888	0.8846	(1.5284)							2.536			Pd-11
	$\beta_1$	1.123													
	$\gamma_1$	(0.736)													
$^{114}_{46}\text{Pd}_{68}$	g	0	0.3329	0.8536	1.5029							2.564			Pd-12
$^{116}_{46}\text{Pd}_{70}$	g	0	0.3406	0.8786								2.580			Pd-12
$^{94}_{48}\text{Cd}_{50}$	g	0	1.435												Cd-1
$^{100}_{48}\text{Cd}_{52}$	g	0	0.857	1.583								1.847			Cd-1
$^{102}_{48}\text{Cd}_{54}$	g	0	0.7768	1.6382	2.2312	(3.0528)	(3.9082)					2.109			Cd-2
	g	0	0.6583	1.4929	2.3717	2.902						2.268			
$^{104}_{48}\text{Cd}_{56}$	g	0	0.63269	1.49388	2.49177	3.36729	4.43608	5.24106				2.361			Cd-3,Cd-4
	$\gamma_1$	1.772													
$^{104}_{48}\text{Cd}_{58}$	g	0	0.63269	1.49388	2.49177	3.36729	4.43608	5.24106				2.361			Cd-5,Cd-6
	$\beta_1$	2.035										2.6293			
	$\gamma_1$	1.7169													
$^{108}_{48}\text{Cd}_{60}$	g	0	0.63295	1.50838	2.54126	3.68311	4.15253	4.70861	5.50241	(6.4657)		2.383	2.20229		Cd-7
	$\beta_1$	(1.938)										2.60153	3.05743		
	$\gamma_1$	1.60169	(2.23926)	(2.6174)								1.597			
$^{110}_{48}\text{Cd}_{62}$	g	0	0.657751	1.542412	2.479893	(3.27533)	(3.836)	(4.175)				2.345	2.0788		Cd-8
	$\beta_1$	1.47309	1.783452	2.220026	2.876749							2.407	2.5396	(2.878)	
	$\gamma_1$	1.475774	2.162763	(2.561235)	2.926585							1.580			

Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands										Octupole band			Ref.	
	C	0 <sup>+</sup> (2 <sup>+</sup> )	2 <sup>+</sup> (3 <sup>+</sup> )	4 <sup>+</sup> (4 <sup>+</sup> )	6 <sup>+</sup> (5 <sup>+</sup> )	8 <sup>+</sup> (6 <sup>+</sup> )	10 <sup>+</sup> (7 <sup>+</sup> )	12 <sup>+</sup> (8 <sup>+</sup> )	14 <sup>+</sup> (9 <sup>+</sup> )	16 <sup>+</sup> (10 <sup>+</sup> )	18 <sup>+</sup> (11 <sup>+</sup> )	R	1 <sup>-</sup> /5 <sup>-</sup>		3 <sup>-</sup> /7 <sup>-</sup>
<sup>112</sup> <sub>48</sub> Cd <sub>64</sub>	g	0	0.61794	1.4142	2.167	(2.880)						2.289	2.5067 (2.374)	2.0051 (2.794)	Cd-9
	$\beta_1$	1.2242	1.4688												
	$\beta_2$	1.4332													
	$\beta_3$	1.8708													
	$\gamma_1$	1.3123	2.0641												
<sup>114</sup> <sub>48</sub> Cd <sub>66</sub>	g	0	0.55845	1.28330								2.298	2.5798 (2.540)	1.95770	Cd-10
	$\beta_1$	1.1342	1.36434	1.7318								2.597			
	$\beta_2$	1.30518	1.8418												
	$\beta_3$	1.8597													
	$\gamma_1$	1.20971	1.86364												
<sup>116</sup> <sub>48</sub> Cd <sub>68</sub>	g	0	0.51340	1.2198	(2.0271)							2.374		1.9215	Cd-11, Cd-12
	$\beta_1$	(1.2821)													
	$\beta_2$	1.3804													
	$\gamma_1$	1.21281	1.9155												
<sup>118</sup> <sub>48</sub> Cd <sub>70</sub>	g	0	0.4878	1.1649	(1.9732)							2.388		1.935	Cd-12, Cd-13 Cd-14
	$\beta_1$	(1.28557)													
	$\gamma_1$	(1.2697)													
<sup>120</sup> <sub>48</sub> Cd <sub>72</sub>	g	0	0.5059	(1.2037)	(2.0337)							2.379		1.920	Cd-12, Cd-13 Cd-15
	$\gamma_1$	(1.3230)													
<sup>122</sup> <sub>48</sub> Cd <sub>74</sub>	g	0	0.56945	(1.32915)								2.334			Cd-12, Cd-16
	$\gamma_1$	1.3678	(1.9794)												
<sup>124</sup> <sub>48</sub> Cd <sub>76</sub>	g	0	0.613												Cd-17
<sup>102</sup> <sub>50</sub> Sn <sub>52</sub>	g	0	1.354												Sn-1
<sup>104</sup> <sub>50</sub> Sn <sub>54</sub>	g	0	1.2162	2.119	2.368							1.742			Sn-1
<sup>106</sup> <sub>50</sub> Sn <sub>56</sub>	g	0	1.2070	2.0191	2.3236	3.4798	(4.1326)					1.673			Sn-2
<sup>108</sup> <sub>50</sub> Sn <sub>58</sub>	g	0	1.2064	2.1115	2.3651	(3.5612)	(4.2568)	(5.4170)				1.750			Sn-3
<sup>110</sup> <sub>50</sub> Sn <sub>60</sub>	g	0	1.2120	2.1970	2.7560	(3.8147)						1.813			Sn-4, Sn-5
	$\gamma_1$	(2.122)	(2.951)												
<sup>112</sup> <sub>50</sub> Sn <sub>62</sub>	g	0	1.2566	2.2472	2.5489							1.788		2.3539	Sn-4, Sn-5 Sn-6, Sn-7
	$\beta_1$	(2.153)	(2.4762)	2.9460	3.4140	4.0777	4.8195	5.6847				2.454			
	$\gamma_1$	2.1513	(2.7563)	3.0792								1.534			
<sup>114</sup> <sub>50</sub> Sn <sub>64</sub>	g	0	1.29992	2.1875								1.683		2.2747	Sn-8
	$\beta_1$	(1.9532)	(2.2392)	2.6143	3.1884	3.8707	4.6722	5.5477				2.312	2.8151	3.0874	
	$\beta_2$	2.155	2.576												
	$\gamma_1$	2.4543	(2.9051)	(3.2259)								1.712			
<sup>116</sup> <sub>50</sub> Sn <sub>66</sub>	g	0	1.29354	2.39222								1.975		2.26609	Sn-5, Sn-9 Sn-10
	$\beta_1$	1.75678	2.11226	2.52912	3.0332	3.7139	4.5077	5.3919				2.173	2.36592	(3.1056)	
	$\beta_2$	2.0273													
	$\beta_3$	(2.546)													
	$\gamma_1$	2.22535	(2.998)												
<sup>118</sup> <sub>50</sub> Sn <sub>68</sub>	g	0	1.22933	2.2803								1.855		(2.310)	Sn-7, Sn-11 Sn-12
	$\beta_1$	1.75806	2.0424	2.4888	2.9994	3.6919	4.4953	(5.379)				2.570	(2.3212)	(2.5748)	
	$\beta_2$	2.05664													
	$\beta_3$	2.49656													
	$\gamma_1$	(2.4026)													
<sup>120</sup> <sub>50</sub> Sn <sub>70</sub>	g	0	1.1715	2.1946								1.873		2.3997	Sn-13
	$\beta_1$	1.8750	2.3556												
	$\gamma_1$	(2.0975)													
<sup>122</sup> <sub>50</sub> Sn <sub>72</sub>	g	0	1.14028	2.1465	3.30536							1.881		(2.49243)	Sn-14
	$\beta_1$	2.08800													
	$\beta_2$	2.52999													
	$\gamma_1$	2.13350	(2.79685)	(2.97293)								1.274			

Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands											Occupied band			Ref.	
	C	$0^+(2^+)$	$2^+(3^+)$	$4^+(4^+)$	$6^+(5^+)$	$8^+(6^+)$	$10^+(7^+)$	$12^+(8^+)$	$14^+(9^+)$	$16^+(10^+)$	$18^+(11^+)$	R	$1^-/5^-$	$3^-/7^-$		
$^{124}_{50}\text{Sn}_{74}$	g	0	1.13164	2.10158	(2.213)	(2.455)						1.857		2.612	Sn-14, Sn-15 Sn-16	
	$\beta_1$	(2.300)														
	$\gamma_1$	2.12932	(2.93624)													
$^{126}_{50}\text{Sn}_{76}$	g	0	1.14115	2.04971	(2.167)							1.796		(2.720)	Sn-16, Sn-17	
	$\gamma_1$	2.11079	(2.74257)													
$^{128}_{50}\text{Sn}_{78}$	g	0	1.16880	2.00034		2.41271	2.49199					1.711			Sn-18	
$^{130}_{50}\text{Sn}_{80}$	g	0	1.22124	1.99561	(2.25695)							1.634			Sn-18	
$^{132}_{50}\text{Sn}_{82}$	g	0	4.041	4.416	4.715	4.847						1.093		(4.041)	Sn-19	
$^{112}_{52}\text{Te}_{60}$	g	0	0.689	1.476								2.142			Te-1	
	$\gamma_1$	1.484														
$^{114}_{52}\text{Te}_{62}$	g	0	0.7090	1.4842	2.2177	3.0893						2.093			Te-2	
$^{116}_{52}\text{Te}_{64}$	g	0	0.6792	1.3603	2.0036	2.7746	3.5767	(4.348)	(5.111)			2.003			Te-3	
	$\beta_1$	(1.219)												(3.028)		
$^{118}_{52}\text{Te}_{66}$	g	0	0.6057	1.2064	1.8209	2.5739	3.3599	4.1720	4.9460			1.992		(2.025)	Te-3, Te-4 Te-5	
	$\beta_1$	(0.9341)	(1.483)											2.5172	2.9998	
	$\gamma_1$	1.1508		1.7017												
$^{120}_{52}\text{Te}_{68}$	g	0	0.5604	1.1615	1.7762	2.6529	3.3642	4.0928	4.3186			2.073			Te-3, Te-5	
	$\beta_1$	(1.1032)	(1.5351)	(1.9244)								1.901		2.4613	2.8991	
	$\gamma_1$	1.2013		1.8151		2.5201										
$^{122}_{52}\text{Te}_{70}$	g	0	0.5642	1.1815	1.7516	2.6702	3.2923					2.094		(2.17)	Te-3, Te-6	
	$\beta_1$	1.3573		1.910	2.284									2.4077	2.759	
	$\gamma_1$	1.2568		1.9511												
$^{124}_{52}\text{Te}_{72}$	g	0	0.60275	1.24876	1.7470	2.6644	(3.1542)					2.073		2.83516	2.29363	Te-7, Te-8
	$\beta_1$	1.65690	2.03946													
	$\beta_2$	1.88332														
	$\beta_3$	2.30945														
	$\gamma_1$	1.32561														
$^{126}_{52}\text{Te}_{74}$	g	0	0.66634	1.3613	1.7755	2.7665	(2.9883)					2.043		2.38609	Te-9, Te-10	
	$\beta_1$	1.87351	(2.0451)													
	$\gamma_1$	1.42017														
$^{128}_{52}\text{Te}_{76}$	g	0	0.7432	1.4971	1.8111							2.014		2.496	Te-11	
	$\beta_1$	1.982														
	$\gamma_1$	(1.523)														
$^{130}_{52}\text{Te}_{78}$	g	0	0.8395	1.6325	1.8145							1.945		2.732	Te-12	
	$\gamma_1$	1.5975														
$^{132}_{52}\text{Te}_{80}$	g	0	0.9739	1.6707	1.7741							1.716		(2.2804)	Te-13	
$^{134}_{52}\text{Te}_{82}$	g	0	1.2797	1.5768	1.6920							1.232			Te-14	
$^{136}_{52}\text{Te}_{84}$	g	0	(1.134)												Te-15	
$^{114}_{54}\text{Xe}_{60}$	g	0	0.4497	(1.0680)								2.375			Xe-1	
	$\gamma_1$	1.1476														
$^{116}_{54}\text{Xe}_{62}$	g	0	0.3935	0.9178	1.5329	2.2103	2.9614	(3.744)				2.332			Xe-2	
	$\beta_1$	(1.3215)	(1.8388)	(2.4984)												
	$\gamma_1$	1.0158	1.4742	1.5570	2.0855	2.1172						1.181				
$^{118}_{54}\text{Xe}_{64}$	g	0	0.3372	0.8099	1.3964	2.0729	2.814	3.588				2.402			Xe-3, Xe-4	
	$\beta_1$	0.8302	1.2280	(1.7304)								2.263				
	$\beta_2$	(1.7207)	(2.1287)													
$^{120}_{54}\text{Xe}_{66}$	$\beta_1$	0.9280	1.3659	1.4410	(1.9219)	(1.9965)	(2.4860)					1.172				
	g	0	0.3224	0.7956	1.3965	2.0479	2.8711	3.6745	(4.4566)			2.468			Xe-4, Xe-5	
	$\beta_1$	0.9084	1.2743	1.7116	(2.724)							2.195				
$^{124}_{54}\text{Xe}_{68}$	$\beta_1$	0.8760	1.2712	1.4009	1.8163	1.9852	2.4598	(2.6525)	(3.1723)	(3.3248)		1.328				
	g	0	0.33096	0.82789	1.46619	2.21684	3.03890	3.81948				2.501			Xe-4, Xe-6	
	$\beta_1$	(1.1490)	(1.4951)													
$^{128}_{54}\text{Xe}_{70}$	$\beta_1$	0.8430	1.2140	1.4026	1.7741	(2.0565)	(2.4598)	(2.8469)				1.508				
	$\gamma_1$															

Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands											Octupole band			Ref.
	C	$0^+(2^+)$	$2^+(3^+)$	$4^+(4^+)$	$6^+(5^+)$	$8^+(6^+)$	$10^+(7^+)$	$12^+(8^+)$	$14^+(9^+)$	$16^+(10^+)$	$18^+(11^+)$	R	$1^-/5^-$	$3^-/7^-$	
$^{124}_{54}\text{Xe}_{70}$	g	0	0.3540	0.8787	1.5482	2.3307	3.1703	3.8814				2.482			Xe-6,Xe-7
	$\beta_1$	1.269													
	$\beta_2$	1.690													
	$\gamma_1$	0.8474	1.2475	1.4373	1.8366							1.474			
$^{124}_{54}\text{Xe}_{72}$	g	0	0.388633	0.9419	1.6349	2.4356						2.424			Xe-8
	$\beta_1$	1.31381													
	$\gamma_1$	0.87988	1.3174	1.4884	1.9032	2.2144	2.5618					1.391			
$^{128}_{54}\text{Xe}_{74}$	g	0	0.44291	1.03297	1.7370	2.5125	3.1964	(3.8091)				2.332			Xe-9,Xe-10
	$\beta_1$	1.58297	1.99961										2.2291		
	$\beta_2$	(1.87730)													
	$\gamma_1$	0.96946	1.42954	1.6034	1.9966							1.378			
$^{130}_{54}\text{Xe}_{76}$	g	0	0.53609	1.20461	1.9444	2.6972	(2.9728)	(3.6938)				2.247			Xe-9,Xe-11
	$\beta_1$	(1.7939)											2.0598	2.3755	
	$\beta_2$	(2.016)													
	$\gamma_1$	1.12218	(1.63255)	(1.8079)	(2.1171)	(2.3621)						1.344			
$^{132}_{54}\text{Xe}_{78}$	g	0	0.66767	1.44027	2.1118							2.157			Xe-12,Xe-13
	$\gamma_1$	1.29784	1.80366	1.9628	2.3507							1.316	2.0401	2.2151	
$^{134}_{54}\text{Xe}_{80}$	g	0	0.847044	1.73116								2.044		(2.4688)	Xe-14
	$\gamma_1$	1.61376	1.91959												
$^{136}_{54}\text{Xe}_{82}$	g	0	1.31307	1.69437	1.89170							1.290		(3.275)	Xe-15
	$\gamma_1$	(1.920)													
$^{138}_{54}\text{Xe}_{84}$	g	0	0.588825	1.07253								1.821		(2.0154)	Xe-16
	$\gamma_1$	1.4640	(1.9031)	2.3313								1.975			
$^{140}_{54}\text{Xe}_{86}$	g	0	0.3768	0.8347								2.215			Xe-17
$^{120}_{56}\text{Ba}_{64}$	g	0	0.1830	0.5415	(1.036)							2.959			Ba-1
$^{122}_{56}\text{Ba}_{66}$	g	0	0.197	0.570	1.083	1.704	2.398	3.124				2.893			Ba-2
$^{124}_{56}\text{Ba}_{68}$	g	0	0.2295	0.652	1.229	1.923	2.687	3.435				2.841			Ba-2
$^{126}_{56}\text{Ba}_{70}$	g	0	0.2561	0.7113	1.3327	2.0889	2.9423	3.7475	4.4197	5.2451	(6.1947)	2.777			Ba-3
$^{128}_{56}\text{Ba}_{72}$	g	0	0.2840	0.7632	1.4069	2.1885	3.0823	3.9883	4.6460	(5.4960)	(6.4364)	2.687			Ba-4
	$\beta_1$	0.8845	1.3244	1.3723	1.9312	1.9394	2.6003	3.3458				1.109	2.0394	2.4128	
	$\gamma_1$	(4.1948)		(5.0357)											
$^{130}_{56}\text{Ba}_{74}$	g	0	0.3574	0.9014	1.5925	2.3948	3.2596	3.9893	4.7830	5.7298	(6.7571)	2.522			Ba-5
	$\gamma_1$	0.9074	1.3603	1.4769	(2.0118)	(2.1007)		(2.7994)		(3.6022)		1.257			
$^{132}_{56}\text{Ba}_{76}$	g	0	0.46458	1.12765	1.9328	(2.796)	(3.729)					2.428		(2.02699)	Ba-6,Ba-7
	$\beta_1$	(1.503)	(1.998)												
	$\gamma_1$	1.03173	1.51117	1.72940								1.455			
$^{134}_{56}\text{Ba}_{78}$	g	0	0.604705	1.40061	(2.2111)	(2.8356)	(2.9569)					2.316			Ba-8
	$\beta_1$	1.76053											1.9859	2.2910	
	$\beta_2$	(2.15966)													
	$\beta_3$	2.33680													
	$\gamma_1$	1.167939	1.64339	1.96987								1.687			
$^{136}_{56}\text{Ba}_{80}$	g	0	0.81850	1.8666	2.2071							2.281	3.436	2.5318	Ba-9,Ba-10
	$\beta_1$	(1.5790)													
	$\beta_2$	(2.1415)													
	$\gamma_1$	(1.5513)													
$^{138}_{56}\text{Ba}_{82}$	g	0	1.435795	1.89891	(2.09066)							1.323	4.0270	2.88098	Ba-11
	$\beta_1$	2.340													
	$\beta_2$	(3.612)	(4.043)												
	$\gamma_1$	2.21797	2.44572												
$^{140}_{56}\text{Ba}_{84}$	g	0	0.60232	1.13058								1.877	(2.23719)	1.80274	Ba-12
	$\beta_1$	1.82399													
	$\gamma_1$	1.51073	(2.1385)	(2.20381)								1.104			



Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma bands										Octupole band		Ref.		
	C	0 <sup>+</sup> (z <sup>+</sup> )	2 <sup>+</sup> (3 <sup>+</sup> )	4 <sup>+</sup> (4 <sup>+</sup> )	6 <sup>+</sup> (5 <sup>+</sup> )	8 <sup>+</sup> (6 <sup>+</sup> )	10 <sup>+</sup> (7 <sup>+</sup> )	12 <sup>+</sup> (8 <sup>+</sup> )	14 <sup>+</sup> (9 <sup>+</sup> )	16 <sup>+</sup> (10 <sup>+</sup> )	18 <sup>+</sup> (11 <sup>+</sup> )	R		1 <sup>-</sup> /5 <sup>-</sup>	3 <sup>-</sup> /7 <sup>-</sup>
<sup>142</sup> <sub>56</sub> Ba <sub>86</sub>	g	0	0.35952	(0.8352)	(1.467)	(2.137)						2.323	(1.3265)	(1.2922)	Ba-13, Ba-1
	$\beta_1$	1.5355													
	$\beta_2$	1.6396													
	$\beta_3$	2.1279													
	$\gamma_1$	1.4241													
<sup>144</sup> <sub>56</sub> Ba <sub>88</sub>	g	0	0.1994	0.5304	0.9621	1.4729						2.660	(0.7590)	(0.3384)	Ba-14, Ba-1
	$\beta_1$	1.0201													
	$\gamma_1$	1.3157													
<sup>146</sup> <sub>56</sub> Ba <sub>90</sub>	g	0	0.1810	0.5144	(0.959)	(1.528)						2.842	(0.7388)	(0.8208)	Ba-14, Ba-1
	$\beta_1$	1.0525													
	$\gamma_1$	1.1152													
<sup>128</sup> <sub>58</sub> Ce <sub>70</sub>	g	0	0.2073	0.6069	1.1575	1.8201	2.5312	3.1077	3.6683	4.3582		2.928			Ce-1
	g	0	0.2539	0.7105	1.3244	2.053	2.809	3.312	3.860	4.553	5.384	2.798			Ce-2
<sup>130</sup> <sub>58</sub> Ce <sub>72</sub>	g	6.341	7.408	8.570	9.812	11.123	(12.450)	(13.735)							
	$\beta_1$	0.835		1.323		1.899		2.561		3.297					
	$\gamma_1$	3.986		4.756											
<sup>132</sup> <sub>58</sub> Ce <sub>74</sub>	g	0	0.3254	0.8576	1.5400	2.3268	(3.1545)	(3.7242)	(4.2364)	(4.9350)	(5.7584)	2.636			Ce-3, Ce-4
	$\gamma_1$	(0.8215)													
<sup>134</sup> <sub>58</sub> Ce <sub>76</sub>	g	0	0.4091	1.0486	1.8630	2.1880	3.7193	4.1836	4.9082	5.7259	6.5981	2.563			Ce-5
	$\gamma_1$	0.9652	1.3825	1.6430		2.3035		3.0172				1.624			
<sup>136</sup> <sub>58</sub> Ce <sub>78</sub>	g	0	0.5520	1.3143	2.2143	2.9902	3.0958	3.7612	4.8353			2.381			Ce-6
	$\gamma_1$	1.0932	1.5543												
<sup>138</sup> <sub>58</sub> Ce <sub>80</sub>	g	0	0.788744	1.8265	2.2938	3.1082	3.5382					2.316		2.1370	Ce-7
	$\beta_1$	1.4769											2.2174		
	$\beta_2$	2.3398													
	$\gamma_1$	1.5105													
<sup>140</sup> <sub>58</sub> Ce <sub>82</sub>	g	0	1.5965	2.0835	2.1061							1.305	3.640	2.4643	Ce-8
	$\beta_1$	1.9033	2.3482												
	$\beta_2$	3.0169													
	$\beta_3$	3.233	(3.731)												
	$\gamma_1$	2.5218													
<sup>142</sup> <sub>58</sub> Ce <sub>84</sub>	g	0	0.64120	1.21929								1.902	(2.39766)	1.65261	Ce-9, Ce-10
	$\beta_1$	2.0305	(2.69630)												
	$\gamma_1$	1.53609													
<sup>144</sup> <sub>58</sub> Ce <sub>86</sub>	g	0	0.3974	0.9386	1.5236							2.362	1.3461	1.2423	Ce-11, Ce-13
	$\beta_1$	1.4816													
	$\gamma_1$	1.4895	1.5920	1.8911								1.983			
<sup>146</sup> <sub>58</sub> Ce <sub>88</sub>	g	0	0.25832	0.6684	1.1713							2.507	0.9246	0.9608	Ce-14
	$\beta_1$	1.0431	1.2743	1.8084								3.310	(1.1831)		
	$\beta_2$	1.6574													
	$\gamma_1$	1.3819	(1.5767)												
<sup>148</sup> <sub>58</sub> Ce <sub>90</sub>	g	0	0.15842	0.45343	0.8409							2.862	0.76029	0.84135	Ce-15, Ce-16
	$\beta_1$	0.77027	0.93559												
	$\gamma_1$	0.98983	1.11662	1.22396								1.847			
<sup>150</sup> <sub>58</sub> Ce <sub>92</sub>	g	0	0.0978	0.3080	0.6087	0.9851						3.149			Ce-17
	g	0	0.0726	0.2366								3.259			Ce-18
<sup>132</sup> <sub>60</sub> Nd <sub>72</sub>	g	0	0.2836	0.741								2.613			Nd-1
	g	0	0.2942	0.7889	1.4200	2.1275						2.682			Nd-2
<sup>134</sup> <sub>60</sub> Nd <sub>74</sub>	g	0	0.3735	0.9762	1.7469	2.6327	3.2965	3.6868	4.3488			2.614			Nd-3
	$\gamma_1$	0.8618	(1.2316)	(1.5398)	(1.9276)							1.833			
<sup>136</sup> <sub>60</sub> Nd <sub>76</sub>	g	0	0.5209	1.2499	2.1343	3.1050	3.1716	(3.8180)				2.400			Nd-4
	$\gamma_1$	1.0140	1.4515	(1.8429)	(2.2616)							1.895	(1.9884)	(2.3187)	

Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands											Octupole band		Ref.	
	C	0 <sup>+</sup> (2 <sup>+</sup> )	2 <sup>+</sup> (3 <sup>+</sup> )	4 <sup>+</sup> (4 <sup>+</sup> )	6 <sup>+</sup> (5 <sup>+</sup> )	8 <sup>+</sup> (6 <sup>+</sup> )	10 <sup>+</sup> (7 <sup>+</sup> )	12 <sup>+</sup> (8 <sup>+</sup> )	14 <sup>+</sup> (9 <sup>+</sup> )	16 <sup>+</sup> (10 <sup>+</sup> )	18 <sup>+</sup> (11 <sup>+</sup> )	R	1 <sup>-</sup> /5 <sup>-</sup>		3 <sup>-</sup> /7 <sup>-</sup>
<sup>140</sup> <sub>60</sub> Nd <sub>80</sub>	g	0	0.7737	1.8024	2.3672							2.330		(2.1240)	Nd-5
	$\beta_1$	1.4132													
	$\beta_2$	2.330													
	$\gamma_1$	1.4900													
<sup>142</sup> <sub>60</sub> Nd <sub>82</sub>	g	0	1.5757	2.1003	2.2095							1.330		(2.0837)	Nd-6
	$\beta_1$	2.2172													
	$\beta_2$	2.978	3.487												
	$\gamma_1$	(2.3846)													
<sup>144</sup> <sub>60</sub> Nd <sub>84</sub>	g	0	0.69649	1.31452	1.79132	2.7095						1.887	2.18568	1.51664	Nd-7,Nd-8
	$\beta_1$	2.0845											(2.0930)	(2.6120)	Nd-9
	$\beta_2$	2.743													
	$\gamma_1$	1.56081	2.17838	2.29513								1.189			
<sup>146</sup> <sub>60</sub> Nd <sub>86</sub>	g	0	0.45388	1.04327								2.299	1.37709	1.18978	Nd-10,Nd-11
	$\beta_1$	1.6027											1.5178		
	$\beta_2$														
	$\gamma_1$	1.47974													
<sup>148</sup> <sub>60</sub> Nd <sub>88</sub>	g	0	0.3017	0.7575	(1.2750)							2.511	1.0229	0.9993	Nd-12
	$\beta_1$	0.7237	1.1710	(1.8586)								2.537			
	$\beta_2$	0.9167													
	$\gamma_1$	1.2486	(1.5124)	(1.6875)								1.664			
<sup>150</sup> <sub>60</sub> Nd <sub>90</sub>	g	0	0.13012	0.3815	(0.7212)	(1.1307)						2.932	(0.850)	(0.930)	Nd-13,Nd-14
	$\beta_1$	0.6767	0.8514	(1.1386)								2.644			
	$\beta_2$														
	$\gamma_1$	1.0624		(1.3535)											
<sup>152</sup> <sub>60</sub> Nd <sub>92</sub>	g	0	0.0759	0.2406	0.4879	0.8100						3.170			Nd-15,Nd-16
	$\beta_1$	1.139	(1.251)												
<sup>154</sup> <sub>60</sub> Nd <sub>94</sub>	g	0	0.0728	0.2352	0.4789	0.8070						3.231			Nd-15
<sup>138</sup> <sub>62</sub> Sm <sub>76</sub>	g	0	0.3227	0.8671	1.5525	2.3279	2.8802	3.2365	(3.894)			2.687			Sm-1
<sup>140</sup> <sub>62</sub> Sm <sub>78</sub>	g	0	0.5308	1.2456	2.0816	2.9688	3.2101	3.6518	4.4032			2.347			Sm-2
<sup>142</sup> <sub>62</sub> Sm <sub>80</sub>	g	0	0.7680	1.7913	(2.4200)							2.332		1.7831	Sm-3
	$\beta_1$	(1.4502)	2.0555											2.3479	
	$\gamma_1$	(1.6576)													
<sup>144</sup> <sub>62</sub> Sm <sub>82</sub>	g	0	1.6602	2.1906	(2.3232)							1.320	3.255	1.8101	Sm-4,Sm-5
	$\beta_1$	2.4779	(2.800)												
	$\beta_2$	2.827	3.318												
	$\beta_3$	3.142	3.426												
	$\gamma_1$	2.4233													
<sup>146</sup> <sub>62</sub> Sm <sub>84</sub>	g	0	0.74724	1.38126	1.81170	2.7376	(3.7232)					1.848		1.38044	Sm-6,Sm-7
	$\beta_1$	1.452	(2.15572)										2.083	2.6003	Sm-8,Sm-9
	$\gamma_1$	1.64833	(2.27014)	(2.43905)								1.272			
<sup>148</sup> <sub>62</sub> Sm <sub>86</sub>	g	0	0.5503	1.1802	1.9059	2.5448	3.2351	(3.9924)				2.145	1.4651	1.1615	Sm-10,Sm-11
	$\beta_1$	1.4263	1.6643										1.5944	2.1286	
	$\gamma_1$	1.4543	(1.9029)	(2.1110)								1.464			
<sup>160</sup> <sub>62</sub> Sm <sub>98</sub>	g	0	0.33395	0.77335	1.27885	1.8371	2.432	3.048	(3.646)	(4.306)		2.316	1.16577	1.07140	Sm-12,Sm-13
	$\beta_1$	0.74042	1.04614	1.44917								2.318	1.3577		
	$\beta_2$	1.25550	1.4173	(1.8194)											
	$\beta_3$	(1.761)	2.0055												
	$\gamma_1$	1.19381	1.50453	1.64260	2.0204							1.444			
	$\gamma_2$	1.7938	2.0633												
<sup>162</sup> <sub>62</sub> Sm <sub>100</sub>	g	0	0.1217825	0.3664814	0.70694	1.12537	1.60934	2.14890	2.73630			3.009	0.963376	1.041180	Sm-14,Sm-15
	$\beta_1$	0.68470	0.810465	1.022962	1.31051	1.66648	2.07965	2.52579	2.97713			2.690	(1.22148)	1.5056	
	$\beta_2$	1.08286	(1.292801)												
	$\gamma_1$	1.085897	1.233876	1.371752	1.55953	1.7283	1.9458	(2.1397)	2.3755			1.932			
<sup>164</sup> <sub>62</sub> Sm <sub>102</sub>	g	0	0.08198	0.2667	0.5443	0.9031	1.3333	1.8262				3.253	0.9216	1.0125	Sm-16
	$\beta_1$	1.0997	1.1782	(1.3714)								3.461	1.1810		
	$\gamma_1$	1.4404	(1.5400)	(1.6606)								2.211			

Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands											Octupole band			Ref.
	C	0 <sup>+</sup> (2 <sup>+</sup> )	2 <sup>+</sup> (3 <sup>+</sup> )	4 <sup>+</sup> (4 <sup>+</sup> )	6 <sup>+</sup> (5 <sup>+</sup> )	8 <sup>+</sup> (6 <sup>+</sup> )	10 <sup>+</sup> (7 <sup>+</sup> )	12 <sup>+</sup> (8 <sup>+</sup> )	14 <sup>+</sup> (9 <sup>+</sup> )	16 <sup>+</sup> (10 <sup>+</sup> )	18 <sup>+</sup> (11 <sup>+</sup> )	R	1 <sup>-</sup> /5 <sup>-</sup>	3 <sup>-</sup> /7 <sup>-</sup>	
<sup>156</sup> <sub>82</sub> Sm <sub>74</sub>	g	0	0.0760	(0.2501)	(0.5179)	(0.878)						3.291			Sm-17
	$\beta_1$	1.068													
	$\gamma_1$	1.441													
<sup>158</sup> <sub>82</sub> Sm <sub>76</sub>	g	0	0.0728	0.2403	0.4985	(0.8445)						3.301			Sm-18
<sup>142</sup> <sub>64</sub> Gd <sub>78</sub>	g	0	0.5260	1.2483	2.0806	2.9271						2.373			Gd-1
	g	0	0.7430	1.7444	2.862							2.348	1.7023		Gd-2,Gd-3
<sup>144</sup> <sub>64</sub> Gd <sub>80</sub>													2.3025	2.7864	
	g	0	1.9718	(2.615)								1.326	(1.5793)		Gd-4,Gd-5
	$\beta_1$	2.1650											2.6580	2.9821	Gd-6,Gd-7
<sup>146</sup> <sub>64</sub> Gd <sub>82</sub>	$\beta_2$	3.016	3.378												
	g	0	0.7843	1.4164	1.8109	2.6933						1.806	1.2734		Gd-8,Gd-9
	$\gamma_1$	(1.8626)											2.082	2.564	
<sup>150</sup> <sub>64</sub> Gd <sub>86</sub>	g	0	0.63805	1.28843	2.116	2.554	3.288	4.105	4.739	5.428	5.764	2.019	1.5927	1.13435	Gd-10,Gd-11
	g	6.450											1.7009	2.211	
	$\beta_1$	1.2072	1.5185	1.7001								1.583			
	$\beta_2$	1.4305	1.9880	(2.0800)								1.165			
	$\gamma_1$														
<sup>152</sup> <sub>64</sub> Gd <sub>88</sub>	g	0	0.344282	0.755397	1.22729	1.74670	2.3004	2.8837	3.4991	4.1426		2.194	1.31467	1.123189	Gd-12
	$\beta_1$	0.615416	0.930582	1.282276	1.66806	2.1387	2.6911	(2.8837)				2.116	(1.47047)	(1.8802)	
	$\beta_2$	1.04784	1.31834	(1.69238)								2.383			
	$\gamma_1$	1.109183	1.433975	1.550182	1.86152	1.99779	(2.39412)					1.358			
	$\gamma_2$	1.605629	1.83963												
<sup>154</sup> <sub>64</sub> Gd <sub>90</sub>	g	0	0.123070	0.371012	0.71774	1.1445	1.6372	2.1850	2.7780	3.4051	4.0158	3.015	1.24134	1.25148	Gd-13,Gd-14
	$\beta_1$	0.68066	0.81554	1.04759	1.3659	1.7567	2.1945	2.6222	3.0279	3.4914	4.0680	2.720	(1.365)	(1.674)	
	$\beta_2$	1.29515	1.41838	(1.69826)								3.271			
	$\gamma_1$	0.99628	1.12782	1.26376	1.4323	1.6066	1.8103					2.033			
	$\gamma_2$	1.53134	1.66092	(1.7902)								1.998			
<sup>156</sup> <sub>64</sub> Gd <sub>92</sub>	g	0	0.0889667	0.288180	0.584706	0.965087	1.4160	1.9244	2.4757	3.0595		3.239	1.24252	1.27611	Gd-15,Gd-16
	$\beta_1$	1.04950	1.12940	1.2778	1.5403	1.8482	2.2199					2.857	1.40805	1.6379	
	$\beta_2$	1.16821	1.25804	1.46227	(1.7659)	(2.1341)	(2.5228)					3.274			
	$\beta_3$	1.71516	1.77104	1.89340								3.190			
	$\gamma_1$	1.15412	1.24796	1.35538	1.50681	1.6448	1.8496	2.0108	2.2494	(2.4425)	(2.6860)	2.145			
	$\gamma_2$	1.82778	1.91635	2.02086								2.180			
<sup>158</sup> <sub>64</sub> Gd <sub>94</sub>	g	0	0.079510	0.261440	0.538983	0.9044	1.3505	1.8667				3.288	1.263462	1.402864	Gd-17
	$\beta_1$	1.196101	1.259817	1.406638								3.305	(1.63927)		
	$\beta_2$	1.452299	1.517401	(1.667289)								3.329			
	$\beta_3$	1.743078	1.791696	1.901504								3.259			
<sup>160</sup> <sub>64</sub> Gd <sub>96</sub>	$\gamma_1$	1.187097	1.265475	1.358415	1.481365							2.179			
	g	0	0.07526	0.2482	0.514	0.868						3.298	(1.224)	1.289	Gd-18,Gd-19
	$\gamma_1$	0.988	1.058	1.148								2.286			
<sup>148</sup> <sub>66</sub> Dy <sub>80</sub>	g	0	0.6829	(1.6082)								2.355	1.7829		Dy-1
													2.2819	2.8088	
<sup>148</sup> <sub>66</sub> Dy <sub>82</sub>	g	0	1.6778	2.427	2.731	2.832	2.918	4.583	5.412			1.447	1.6882		Dy-2
													2.3495	2.7391	
<sup>150</sup> <sub>68</sub> Dy <sub>84</sub>	g	0	0.8034	1.4568	1.8507	2.4018	3.026	3.835	4.337	4.567	5.071	1.827	(1.3947)		Dy-3,Dy-4
<sup>152</sup> <sub>68</sub> Dy <sub>86</sub>	g	0	0.6137	1.2609	1.9442	2.4370	3.1834	3.8199	(4.4300)			2.055	1.2275		Dy-5
													1.7816	2.3423	
<sup>154</sup> <sub>68</sub> Dy <sub>88</sub>	g	0	0.3346	0.7467	1.2237	1.7473	2.3043	2.8930	3.5092	4.0910	4.6376	2.232	1.4207	1.2078	Dy-6,Dy-7
	g	5.2499	5.9351	6.6910	7.5140	8.4013	9.1370	(9.9418)				2.419	1.5495	1.9649	
	$\beta_1$	0.6608	0.9052	1.2519	1.6590	2.1632									
	$\beta_2$	1.0577	1.3904												
	$\gamma_1$	1.0270	1.3343	1.4426	1.7400	(1.8856)	(2.1833)					1.352			
	$\gamma_2$	1.5074	(1.7820)												

Nucleus	C	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands										Octupole band			Ref.
		$0^+(2^+)$	$2^+(3^+)$	$4^+(4^+)$	$6^+(5^+)$	$8^+(6^+)$	$10^+(7^+)$	$12^+(8^+)$	$14^+(9^+)$	$16^+(10^+)$	$18^+(11^+)$	R	$1^-/5^-$	$3^-/7^-$	
$^{156}_{64}\text{Dy}_{90}$	g	0	0.13783	0.40412	0.77033	1.21569	1.72502	2.28588	2.88782	3.49891	4.02607	2.932	1.29275	1.36831	Dy-8,Dy-9
	g	4.63556	5.32026	6.0687	6.8766	7.738	8.650						1.52594	1.80997	
	$\beta_1$	0.67560	0.82870	1.08833	1.43710	1.85864	2.31559	2.70687	3.06588	3.52328	4.17817	2.696			
	$\beta_2$	4.85904													
	$\beta_2$		(1.44738)	(1.62726)	(1.89868)	(2.26162)	(2.70091)								
	$\gamma_1$	0.89071	1.02205	1.16846	1.33523	1.52523	1.72879	1.95720	2.19162	2.44803	2.71237	2.122			
	$\gamma_2$	(2.99723)													
$^{158}_{64}\text{Dy}_{92}$	g	0	0.09894	0.31726	0.63787	1.0441	1.5199	2.0492	2.6126	3.1907	3.7817	3.207	1.2998	1.39715	Dy-10,Dy-11
	g	4.4075	5.0856	5.8203	6.6129								(1.52806)		
	$\beta_1$	0.9906	1.08563	1.28003	1.5473	(1.890)						3.045			
	$\gamma_1$	0.94627	1.04452	1.16372	1.31147	1.4864	1.6758	(1.8969)				2.213			
	$\gamma_2$	1.8522	1.94072	2.05537	2.2111	2.3888						2.295			
$^{160}_{64}\text{Dy}_{94}$	g	0	0.086788	0.283823	0.5812	0.9672	1.4286	1.9514	2.5152	3.0919	3.6724	3.270	1.28558	1.39893	Dy-12,Dy-13
	$\beta_1$	(1.275)	(1.3495)												
	$\gamma_1$	0.966152	1.04909	1.15589	1.2888	1.4380						2.288			
$^{162}_{64}\text{Dy}_{96}$	g	0	0.08066	0.26567	0.54853	0.92128	1.37515	1.9030	2.494	3.143	3.833	3.294	1.2766	1.3579	Dy-14,Dy-15 Dy-16
	$\beta_1$	(1.131)	(1.2056)	(1.3893)								3.463	1.5189	1.7555	
	$\beta_2$	1.4003	1.4530	1.5735	1.7675	1.9861	2.2622	(2.594)	(2.9558)			3.287			
	$\beta_3$	1.670													
	$\gamma_1$	0.88822	0.96300	1.06105	1.18282	1.32455	1.4904	1.6704	1.8782	2.0877	2.3377	2.311			
$^{164}_{64}\text{Dy}_{98}$	g	0	0.073392	0.24230	0.50132	0.84367	1.25876					3.301			Dy-17,Dy-18
	$\gamma_1$	0.76178	0.82817	0.91596	1.02474	1.15887						2.322			
$^{166}_{64}\text{Dy}_{100}$	g	0	0.076581	0.253511	(0.52694)							3.310			Dy-19
$^{146}_{64}\text{Er}_{80}$	g	0	0.3466	(1.5240)	(2.5269)	(2.7844)	(2.9155)					2.357			Er-1
													(2.2543)	(2.5372)	
$^{150}_{64}\text{Er}_{82}$	g	0	1.5789		2.6214	2.7340	2.7972	4.2436	4.9277	5.2225			1.7865		Er-2
													2.2610	2.6334	
$^{152}_{64}\text{Er}_{84}$	g	0	0.8081	1.4807	1.9033	2.1833	2.9476	3.7348	4.2892	4.5193		1.832			Er-3
$^{154}_{64}\text{Er}_{86}$	g	0	0.560	1.161	1.786	2.328	3.016	3.653	4.272	4.922	5.324	2.073			Er-4
$^{156}_{68}\text{Er}_{88}$	g	0	0.3445	0.7969	1.3403	1.9587	2.6329	3.3146	3.8373	4.3813	5.0064	2.315	(1.5179)	1.3035	Er-5,Er-6
	g	5.7166	6.4887	7.3156	8.0816	8.7633	9.5293	10.3291					(1.6114)	2.030	
	$\beta_1$	0.9303	1.2206	1.5464								2.122			
	$\beta_2$		1.4059	1.7105											
	$\gamma_1$	0.9304	1.2430	1.3512	1.6635							1.346			
$^{158}_{68}\text{Er}_{90}$	g	0	0.19218	0.52721	0.9706	1.4943	2.0741	2.6829	3.1933	3.6666	4.2335	3.101	(1.41827)	1.34195	Er-7,Er-8
	g	4.8929	5.6329	6.4391	7.2851	8.1443	9.0208	9.9275	10.8878	11.9065	12.9678				
	$\beta_1$	0.80641	0.98909	1.25730								2.468			
	$\beta_2$	1.3869	(1.5702)												
	$\gamma_1$	0.82013	1.04341	1.18373								1.628			
$^{160}_{68}\text{Er}_{92}$	g	0	0.12561	0.38953	0.7647	1.2284	1.7601	2.3393	2.9315	3.4654	4.0208	3.101			Er-9,Er-10 Er-11
	g	4.661	5.383	6.177	7.029	7.931	8.867	9.829	10.811	11.854					
	$\beta_1$	0.89376	1.00807												
	$\gamma_1$	0.85470	0.98731												
$^{162}_{68}\text{Er}_{94}$	g	0	0.10208	0.32963	0.66676	1.0968	1.6028	2.1651	2.7457	3.2923	3.8465	3.229	1.35210	1.35673	Er-12,Er-13
	g	4.4628											1.4691	1.6823	
	$\beta_1$	1.08713	1.17095												
	$\beta_2$	(1.42039)	1.50039												
	$\gamma_1$	0.90068	1.00192	1.1282	1.2863	1.4597	1.6692	1.8728	2.1339	2.3467	2.6566	2.246			
	$\gamma_2$	2.9111													

Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands											Octupole band			Ref.
	C	0 <sup>+</sup> (2 <sup>+</sup> )	2 <sup>+</sup> (3 <sup>+</sup> )	4 <sup>+</sup> (4 <sup>+</sup> )	6 <sup>+</sup> (5 <sup>+</sup> )	8 <sup>+</sup> (6 <sup>+</sup> )	10 <sup>+</sup> (7 <sup>+</sup> )	12 <sup>+</sup> (8 <sup>+</sup> )	14 <sup>+</sup> (9 <sup>+</sup> )	16 <sup>+</sup> (10 <sup>+</sup> )	18 <sup>+</sup> (11 <sup>+</sup> )	R	1 <sup>+</sup> /5 <sup>+</sup>	3 <sup>+</sup> /7 <sup>+</sup>	
<sup>164</sup> <sub>68</sub> Er <sub>96</sub>	g	0	0.09139	0.29947	0.61440	1.02461	1.5179	2.0828	2.7026	3.2631	3.7686	3.277	1.387	1.434	Er-14, Er-15 Er-16
	g	(4.3453)	(5.0001)	(5.7291)									1.554	(1.764)	
	$\beta_1$	1.24602	1.31463	1.4699	1.707	2.067						3.263			
	$\beta_2$	(1.76589)	1.78849												
	$\beta_3$	2.1725	2.2783												
	$\gamma_1$	0.86031	0.94635	1.05829	1.1976	1.3586	1.5449	1.7447	(1.9771)	(2.1841)	(2.4794)	2.301			
$\gamma_1$	(2.7331)	(3.0272)	(3.2668)	(3.5186)	(3.8002)	(4.0178)	(4.3638)	(4.5900)		(5.2305)					
<sup>166</sup> <sub>68</sub> Er <sub>98</sub>	g	0	0.080574	0.26498	0.54544	0.91119	1.3495	1.8465	2.3893	2.9685		3.289	(1.66245)	1.719	Er-17, Er-18
	$\beta_1$	1.45993	1.5282	(1.6788)							3.206				
	$\gamma_1$	0.78589	0.85938	0.95620	1.07526	1.21592	1.37600	1.55568			2.317				
<sup>168</sup> <sub>68</sub> Er <sub>100</sub>	g	0	0.079804	0.264088	0.548745	0.928302	1.396824					3.309	1.78609	1.91390	Er-19, Er-20
	$\beta_1$	1.217200	1.276269	1.411093	1.616803	(1.890262)					3.283	2.18506			
	$\beta_2$	1.42224	1.493130	1.656268	1.902690						3.301				
	$\beta_3$	(1.8335)	1.893094	(2.031086)	(2.246490)						3.316				
	$\gamma_1$	0.821166	0.895792	0.994745	1.117568	1.263904	1.432948	1.624504			2.326				
<sup>170</sup> <sub>68</sub> Er <sub>102</sub>	g	0	0.07859	0.2601	0.5411	0.913	1.374					3.310	1.3044		Er-21
	$\beta_1$	0.8909	0.9598	(1.123)							3.369				
	$\gamma_1$	0.932	1.0105	1.101							2.153				
<sup>162</sup> <sub>70</sub> Yb <sub>92</sub>	g	0	1.5312										(1.8897)		Yb-1
													(2.2020)	(2.5494)	
<sup>166</sup> <sub>70</sub> Yb <sub>96</sub>	g	0	0.5364	1.1437	1.7285 <sup>a</sup>	2.2726	2.9565	3.5710				2.132			Yb-2
<sup>168</sup> <sub>70</sub> Yb <sub>98</sub>	g	0	0.3584	0.8349	1.4042	2.0480	(2.7454)	(3.4285)				2.330			Yb-3
<sup>150</sup> <sub>70</sub> Yb <sub>80</sub>	g	0	0.2433	0.6389	1.1480	1.7377	2.3749	2.9619	3.3659	3.8500	4.4280	2.626			Yb-4, Yb-5
	g	5.0925	5.8293	6.6252	7.4615	8.2926	9.129	10.007	(10.960)	(11.967)	(13.049)				
	g	(14.207)													
	$\beta_1$	1.085	1.2930												
	$\beta_2$	1.2218	1.3586												
$\gamma_1$	0.8204	1.1126	1.2557								2.490				
<sup>162</sup> <sub>70</sub> Yb <sub>92</sub>	g	0	0.1663	0.4866	0.9233	1.4444	2.0233	2.6338	3.2565			2.926			Yb-6
	g	0	0.1238	0.3859	0.7602	1.222	1.752	2.329	2.899	3.389	3.932	3.117			Yb-7, Yb-8
	g	4.565	5.278	6.058	(6.904)										
<sup>164</sup> <sub>70</sub> Yb <sub>94</sub>	$\beta_1$	0.9759	1.0738	(1.3232)							3.547				
	$\gamma_1$	0.8639	1.0042	1.1448	(1.3652)						2.002				
<sup>166</sup> <sub>70</sub> Yb <sub>96</sub>	g	0	0.1023	0.3304	0.6679	1.0981	1.6058	2.1756	2.7792	3.2736	3.783	3.230	(1.3588)		Yb-9, Yb-10
	g	4.371	5.039	5.777											
	$\beta_1$	(1.043)													
	$\gamma_1$	0.9322	1.0391	1.1625	1.3276	1.4822	1.705		2.151		(2.648)	2.154			
	$\gamma_1$		(3.198)												
<sup>168</sup> <sub>70</sub> Yb <sub>98</sub>	g	0	0.07773	0.28655	0.58530	0.97006	1.424	(1.936)	(2.489)	(3.073)	(3.687)	3.266			Yb-11, Yb-12
	g	(4.337)	(5.037)	(5.798)	(6.624)	(8.475)	(9.496)	(10.575)							
	$\beta_1$	(1.156)	(1.2335)	1.3911								3.034			
	$\beta_2$	1.198	(1.277)												
	$\beta_3$	1.543													
$\gamma_1$	0.9838	(1.0669)	(1.1712)	(1.3023)	(1.4451)						2.255				
<sup>170</sup> <sub>70</sub> Yb <sub>100</sub>	g	0	0.08426	0.27745	0.5736	0.9636	1.4379	1.9837	2.5808	3.1962	3.8081	3.293	1.36450	1.39695	Yb-13, Yb-14
	g	(4.4389)											(1.5104)	(1.7126)	
	$\beta_1$	1.06936	1.1390	(1.2943)	1.5216	1.8037	(2.1360)	(2.5246)				3.230			
	$\beta_2$	(1.22863)	(1.30640)												
	$\beta_3$	1.4799	(1.53459)												
$\gamma_1$	1.146	1.2254	(1.3297)	(1.4600)	1.6019	(1.7808)	1.9547	(2.2150)	2.3735		2.314				
<sup>172</sup> <sub>70</sub> Yb <sub>102</sub>	g	0	0.078750	0.260283	0.53984	0.9115	1.3698	1.9072	2.5184	(3.1981)		3.305	1.600	1.711	Yb-15, Yb-16 Yb-17
	$\beta_1$	1.04293	1.11785	1.2865	1.5375	1.8536	2.2125	2.6072	(3.0439)		2.936				
	$\beta_2$	1.40487	1.47676	1.63250							3.166				
	$\beta_3$	1.79405	1.84980	1.975	2.156						3.246				
	$\gamma_1$	1.46586	1.54906	(1.65791)							2.308				
	$\gamma_2$	1.60842	1.70057	1.80304							2.112				

Nucleus	C	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands										Octupole band		Ref.	
		0 <sup>+</sup> (2 <sup>+</sup> )	2 <sup>+</sup> (3 <sup>+</sup> )	4 <sup>+</sup> (4 <sup>+</sup> )	6 <sup>+</sup> (5 <sup>+</sup> )	8 <sup>+</sup> (6 <sup>+</sup> )	10 <sup>+</sup> (7 <sup>+</sup> )	12 <sup>+</sup> (8 <sup>+</sup> )	14 <sup>+</sup> (9 <sup>+</sup> )	16 <sup>+</sup> (10 <sup>+</sup> )	18 <sup>+</sup> (12 <sup>+</sup> )	R	1 <sup>-</sup> /5 <sup>-</sup>		3 <sup>-</sup> /7 <sup>-</sup>
<sup>174</sup> <sub>70</sub> Yb <sub>104</sub>	g	0	0.076480	0.253123	0.526029	0.8895	1.3362	1.8606	2.4565	3.117	3.836	3.310	1.71090	1.78580	Yb-18, Yb-19 Yb-20
	$\beta_1$	1.48743	1.56101	1.71540	1.9091							3.09%			
	$\beta_2$	1.888	1.9582	2.1230								3.348			
	$\beta_3$	2.1015	2.1718	2.3368								3.347			
	$\gamma_1$	1.6337	1.7091	1.8051	1.926							2.273			
<sup>176</sup> <sub>70</sub> Yb <sub>106</sub>	g	0	0.08213	0.27169	0.5648	0.9541	1.4312	1.9848	2.602	3.270	3.979	3.308			Yb-20, Yb-21
	$\gamma_1$	(1.2609)	(1.336)	(1.4356)								2.326			
<sup>178</sup> <sub>70</sub> Yb <sub>108</sub>	g	0	0.082	(0.281)	(0.342)							3.427			Yb-22
	$\beta_1$	1.317	(1.402)												
	$\gamma_1$	1.222													
<sup>162</sup> <sub>72</sub> Hf <sub>90</sub>	g	0	0.284	0.728	1.291	1.938	2.633	3.183	3.564	4.065	4.650	2.563			Hf-1
	g	5.307	6.031	6.821	7.683	8.473									
<sup>164</sup> <sub>72</sub> Hf <sub>92</sub>	g	0	0.211	0.588	1.087	1.671	2.307	2.875	3.214	3.682	4.266	2.787			Hf-2
	g	4.942	5.703	6.549	7.466										
<sup>166</sup> <sub>72</sub> Hf <sub>94</sub>	g	0	0.1587	0.4707	0.8974	1.4070	1.9728	2.5672	3.0108	3.4509	4.0113	2.966			Hf-3
	g	4.6737	5.4128												
<sup>168</sup> <sub>72</sub> Hf <sub>96</sub>	g	0	0.1239	0.3856	0.7570	1.2136	1.7356	2.3055	2.8569	3.3097	3.8317	3.112			Hf-4
	g	4.4391	5.1232	5.8741	6.6864	7.5609									
<sup>170</sup> <sub>72</sub> Hf <sub>98</sub>	g	0	0.1008	0.3220	0.6428	1.0432	1.5054	2.0163	2.5670	3.1514	3.7666	3.194			Hf-5
	g	4.4211	5.1304	5.9027	6.7393										
<sup>172</sup> <sub>72</sub> Hf <sub>100</sub>	g	0	0.09526	0.30933	0.62814	1.0375	1.5213	2.0648	2.6543	3.2775	3.9199	3.247			Hf-6, Hf-7
	g	4.5764	5.2749												
	$\beta_1$	0.87134	0.95246	1.12972								3.185			
	$\beta_2$	1.29563													
	$\beta_3$	1.33569	1.39751	1.53445								3.215			
<sup>174</sup> <sub>72</sub> Hf <sub>102</sub>	g	0	0.09101	0.29747	0.6083	1.0095	1.4857	2.0205	2.5975	3.2089	3.8573	3.268			Hf-8, Hf-9 Hf-10
	g	4.5508													
	$\beta_1$	0.8274	0.9004	1.0625	1.3074	1.6305	2.0263	2.4889	2.9925	(3.5004)		3.227			
	$\beta_2$	1.239	(1.3190)	(1.5033)								3.304			
	$\gamma_1$	1.22681	1.33665	1.44893	1.65854							2.022			
<sup>176</sup> <sub>72</sub> Hf <sub>104</sub>	g	0	0.08835	0.29018	0.5970	0.9980	1.4813	2.0348				3.284	1.4634	(1.7102)	Hf-11, Hf-12
	$\beta_1$	1.1499	1.2266	1.3902	1.6286	1.9327	2.2950				3.133				
	$\beta_2$	1.2932	1.3793	(1.5916)							3.466				
	$\gamma_1$	1.3413	1.4458	1.5402	1.7277	1.8619	(2.1066)	(2.2850)			1.903				
<sup>178</sup> <sub>72</sub> Hf <sub>106</sub>	g	0	0.093170	0.30661	0.6322	1.0586	1.5710	2.1507	2.7776	3.4362	(4.1206)	3.291			Hf-13, Hf-14
	$\beta_1$	1.19924	1.27654	(1.4510)							3.257				
	$\beta_2$	1.43397	1.4962	1.63583							3.257				
	$\gamma_1$	1.44386	(1.5616)								2.228				
<sup>180</sup> <sub>72</sub> Hf <sub>108</sub>	g	0	0.093324	0.308576	0.64085	1.0741	1.6206	2.2626				3.307			Hf-14, Hf-15
	$\beta_1$	1.1072	1.1997	1.4092							3.264				
	$\beta_2$	1.1642	1.2608	1.4846							3.317				
	$\gamma_1$	1.30036	1.38157												
<sup>182</sup> <sub>72</sub> Hf <sub>110</sub>	g	0	0.0979	0.3223	0.6664	1.1225						3.292			Hf-16
<sup>164</sup> <sub>71</sub> W <sub>84</sub>	g	0	0.1993	0.5627	1.0427	1.6011	2.2027	2.7229	3.0109	3.4476	4.0127	2.815			W-1
	g	4.6838	5.4379	6.2465	7.0785	(7.922)							1.5370	1.8352	
<sup>170</sup> <sub>71</sub> W <sub>90</sub>	g	0	0.1567	0.4627	0.8759	1.3638	1.9019	2.4847	2.9113	3.3442	3.8744	2.953			W-2
	g	4.4909	5.1769	5.9189	6.7147	7.5698	8.4887	(9.4322)	(10.3909)	(11.3705)					
<sup>174</sup> <sub>71</sub> W <sub>96</sub>	g	0	0.1229	0.3769	0.7272	(1.1465)	(1.616)	(2.129)	(2.677)			3.067			W-3
<sup>174</sup> <sub>74</sub> W <sub>100</sub>	g	0	0.1119	0.355	0.704	1.137	1.635	2.186	2.780	3.392	3.973	3.172			
	g	4.602	(5.311)												
<sup>178</sup> <sub>74</sub> W <sub>104</sub>	g	0	0.1089	0.3495	0.6994	1.140	1.648	2.206	2.801	3.425	4.002	3.209			W-4

Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands											Octupole band		Ref.		
	C	$0^+(2^+)$	$2^+(3^+)$	$4^+(4^+)$	$6^+(5^+)$	$8^+(6^+)$	$10^+(7^+)$	$12^+(8^+)$	$14^+(9^+)$	$16^+(10^+)$	$18^+(11^+)$	R	$1^-/3^-$		$3^-/7^-$	
$^{174}_{74}\text{W}_{104}$	g	0	0.1061	0.3431	0.6947	1.1423	1.6661	2.2452	2.8593	3.4891	4.1016	3.241		1.117	W-5,W-6	
	$\beta_1$	1.001	1.0828	1.2757	1.5565	1.9166	2.3407	2.8049	(3.3202)			3.354			W-7	
	$\beta_2$	1.356														
	$\beta_3$	1.643														
	$\gamma_1$	1.117														
$^{180}_{74}\text{W}_{106}$	g	0	0.10357	0.33755	0.68845	1.13847	1.66418	2.23518	2.825	3.416	4.021	3.262			W-7,W-8	
	$\beta_1$	1.516	1.589												W-9	
	$\beta_2$	1.695														
	$\gamma_1$	1.11721	1.23268	1.36053	1.53562	1.70297	1.9322	(2.1274)				2.107				
	$\beta_3$	0	0.1001064	0.329423	0.68189	1.1445	1.712	2.237	(3.113)			3.291				W-8,W-10
$^{182}_{74}\text{W}_{108}$	g	0	0.1001064	0.329423	0.68189	1.1445	1.712	2.237	(3.113)			3.291			W-11	
	$\beta_1$	1.1357	1.25780	1.51026								3.068				
	$\gamma_1$	1.22155	1.33216	1.44294	1.62036	1.76291						2.002				
	$\beta_2$	0	0.111207	0.364955	0.748309	1.252	1.861					3.274				W-12,W-13
	$\beta_1$	1.00249	1.12144	(1.359)								2.997				
$^{184}_{74}\text{W}_{110}$	g	0	0.111207	0.364955	0.748309	1.252	1.861					3.274			W-12,W-13	
	$\beta_1$	1.00249	1.12144	(1.359)								2.997				
	$\beta_2$	(1.3221)	1.43101													
	$\beta_3$	1.61490														
	$\gamma_1$	0.903283	1.005968	1.133840	1.29406	(1.479)						2.245				
$^{186}_{74}\text{W}_{112}$	g	0	0.12230	0.39647	0.80847	1.348	2.002					3.242			W-13,W-14	
	$\beta_1$	(0.8820)	(1.0063)													
	$\beta_2$	(1.1500)														
	$\gamma_1$	0.73754	(0.86178)	(1.0315)								2.366				
	$\beta_3$	0	0.143	(0.442)	(0.780)							3.091				W-15
$^{188}_{74}\text{W}_{114}$	g	0	0.143	(0.442)	(0.780)							3.091			W-15	
	$\beta_1$	0.886														
	$\beta_2$	1.960														
	$\beta_3$	0	0.2280	0.6067	1.0554	1.5265	2.0262	2.5674	3.1047	3.5929	4.1804	2.661				Os-1
	$\gamma_1$	4.8363	(5.532)	(6.258)												
$^{174}_{76}\text{Os}_{98}$	g	0	0.1588	0.4351	0.7779	1.1724	1.6184	2.1148	2.6577	3.2417	3.8637	2.740			Os-1	
	$\gamma_1$	4.5270	5.2351	5.9891	6.7882											
$^{176}_{76}\text{Os}_{100}$	g	0	0.1351	0.3951	0.7424	1.1574	1.6337	2.1675	2.7543	3.3811	4.0188	2.925			Os-2	
	$\gamma_1$	4.6829	5.3985	6.1470												
$^{178}_{76}\text{Os}_{102}$	g	0	0.1320	0.3984	0.7611	1.1934	1.6815	2.2193	2.8042	3.4288	4.0196	3.016			Os-2,Os-3	
	$\beta_1$	4.6625	(5.3817)	(6.1540)	(6.987)											
	$\beta_2$			(1.167)	(1.450)	(1.814)	(2.249)	(2.753)	(3.320)	(3.942)						
	$\gamma_1$	0.770	0.908	(1.062)	(1.211)							2.116				
$^{180}_{76}\text{Os}_{104}$	g	0	0.1323	0.4090	0.7956	1.2583	1.7688	2.3101	2.8765	3.4039	3.9275	3.091			Os-2,Os-4	
	$\beta_1$	4.5448	(5.2387)	(5.9838)	(6.7687)	(7.5472)	(8.2705)									
	$\gamma_1$	0.8703	1.0228	1.1968	1.377							2.141				
$^{182}_{76}\text{Os}_{106}$	g	0	0.1270	0.4005	0.7944	1.2783	1.8124	2.3465	2.8410	3.3204	3.8574	3.154			Os-5,Os-6	
	$\beta_1$	4.4805	5.1922	5.9874												
	$\gamma_1$	0.8908	1.0394	1.1907	1.4000	1.5893	1.8535					2.018				
$^{184}_{76}\text{Os}_{108}$	g	0	0.11979	0.38377	0.77417	1.27490	1.8704	2.5463	(3.2593)	(3.7886)	(4.3423)	3.204			Os-7	
	$\beta_1$	(4.9977)	(5.7373)													
	$\gamma_1$	1.042	(1.208)									2.042				
$^{186}_{76}\text{Os}_{110}$	g	0	0.13716	0.43408	0.86894	1.42094	2.0681	2.7814	3.4395	3.9340	(4.4934)	3.165		1.48010	Os-8,Os-9	
	$\beta_1$	1.06126	1.20834	1.4608	(1.8125)							2.717			Os-10	
	$\beta_2$	1.456														
	$\beta_3$	1.953														
	$\gamma_1$	0.76750	0.91048	1.07050	1.27561	1.4909	(1.7516)					2.119				
$\gamma_2$	1.75444	1.84838														

Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands								Octopole band		Ref.				
	C	0 <sup>+</sup> (2 <sup>+</sup> )	2 <sup>+</sup> (3 <sup>+</sup> )	4 <sup>+</sup> (4 <sup>+</sup> )	6 <sup>+</sup> (5 <sup>+</sup> )	8 <sup>+</sup> (6 <sup>+</sup> )	10 <sup>+</sup> (7 <sup>+</sup> )	12 <sup>+</sup> (8 <sup>+</sup> )	14 <sup>+</sup> (9 <sup>+</sup> )	16 <sup>+</sup> (10 <sup>+</sup> )		18 <sup>+</sup> (11 <sup>+</sup> )	R	1 <sup>-</sup> /5 <sup>-</sup>	3 <sup>-</sup> /7 <sup>-</sup>
<sup>186</sup> <sub>76</sub> Os <sub>112</sub>	g	0	0.155040	0.47797	0.94030	1.5147	2.1697	(2.8556)				3.083			
	$\beta_1$	1.08638	1.30485										1.41383	Os-11	
	$\beta_2$	1.47812											1.66871		
	$\beta_3$	1.70437													
	$\gamma_1$	0.633043	0.79001	0.96570	(1.18102)	(1.42515)	(1.6856)					2.114			
<sup>188</sup> <sub>76</sub> Os <sub>114</sub>	g	0	0.186718	0.547853	1.05040	1.6665	(2.3575)	(3.1265)				2.934		Os-12,Os-13	
	$\beta_1$	0.91178	1.11473												
	$\beta_2$	1.54531													
	$\beta_3$	1.73288													
	$\gamma_1$	0.557979	0.756029	0.955377	1.20386	(1.4743)		(2.0883)	(2.7423)			2.007			
<sup>192</sup> <sub>78</sub> Pt <sub>118</sub>	g	0	0.205774	0.580284	1.0886	1.7081	2.4185	(3.212)				2.820	1.341130	Os-14,Os-15	
	$\beta_1$	0.9565	1.1275	(1.4566)								2.925		Os-16	
	$\beta_2$	1.2059													
	$\gamma_1$	0.489038	0.690335	0.909556	1.143508	1.465189		2.1336	(2.894)			2.089			
	$\gamma_2$														
<sup>194</sup> <sub>78</sub> Os <sub>118</sub>	g	0	0.21851	0.601								2.753		Os-17,Os-18	
	$\beta_1$	0.696													
	$\gamma_1$	0.65652													
<sup>178</sup> <sub>78</sub> Pt <sub>98</sub>	g	0	0.2277											Pt-1	
	$\beta_1$	0.1589												Pt-1	
<sup>180</sup> <sub>78</sub> Pt <sub>102</sub>	g	0	0.1522	(0.4086)								2.748		Pt-2	
	$\beta_1$	(0.8597)	(1.184)												
	$\gamma_1$	(0.6766)	(0.9608)												
<sup>182</sup> <sub>78</sub> Pt <sub>104</sub>	g	0	0.1549	0.4182	0.7772	1.2114	1.708	2.255				2.700		Pt-3,Pt-4	
	$\beta_1$	0.4975	0.8553	1.1813								1.916			
	$\gamma_1$	0.6673	0.9420	1.0335	1.308							1.333			
<sup>184</sup> <sub>78</sub> Pt <sub>106</sub>	g	0	0.16296	0.43595	0.79842	1.2307	1.7074	(2.2049)	(2.7273)	(3.2825)	(3.8691)	2.675		Pt-4,Pt-5	
	$\beta_1$	(4.4935)													
	$\gamma_1$	0.49194	0.84413	(1.23485)								2.109			
<sup>186</sup> <sub>78</sub> Pt <sub>108</sub>	g	0	0.1915	0.4901	0.8772	1.3411	1.8557	2.407				2.559	(1.4078)	Pt-3,Pt-6	
	$\beta_1$	0.4715	0.7984	1.2275								2.313			
	$\gamma_1$	0.6071	(0.9566)												
<sup>188</sup> <sub>78</sub> Pt <sub>110</sub>	g	0	0.26589	0.67134	1.18427	1.78225	2.43714	(2.81007)	(3.1391)	(3.6273)		2.525	1.7753	1.3496	Pt-7
	$\beta_1$	0.79900	1.11536												
	$\gamma_1$	0.60616	0.93680	1.08580	(1.4435)	1.63576		2.24629				1.401			
<sup>190</sup> <sub>78</sub> Pt <sub>112</sub>	g	0	0.29582	0.73712	1.2876	1.9153	2.5353	2.7267	3.0693	3.5765	(4.2143)	2.492	1.7373	1.3539	Pt-8
	$\beta_1$	0.9209	1.2029												
	$\gamma_1$	1.670													
<sup>192</sup> <sub>78</sub> Pt <sub>114</sub>	g	0	0.31650	0.78456	1.3653	2.0181	2.5187	2.6234	2.9980	3.5418	4.2036	2.479	1.7394	1.3779	Pt-6,Pt-9
	$\beta_1$	(4.9499)													
	$\beta_2$	1.1953	1.4390	1.937								3.043		Pt-10,Pt-11	
	$\beta_3$	1.542													
	$\gamma_1$	0.61245	0.92090	1.20103	1.4819		2.1131					1.908			
<sup>194</sup> <sub>78</sub> Pt <sub>116</sub>	g	0	0.328485	0.81130	1.4118	2.0995	2.4385	(2.8295)				2.470	1.79737	1.43252	Pt-10,Pt-12
	$\beta_1$	1.26718	1.51197	1.911								2.631		Pt-13	
	$\beta_2$	1.47923	(1.77865)												
	$\beta_3$	1.54724													
	$\gamma_1$	0.62202	0.92277	1.22960	1.4987	1.9257						2.020			
<sup>196</sup> <sub>78</sub> Pt <sub>118</sub>	g	0	0.355684	0.876852	1.527	2.255	2.995					2.465	1.825696	1.447027	Pt-10,Pt-14
	$\beta_1$	1.135292	1.361566	1.884								3.310			Pt-15
	$\beta_2$	1.402704	1.604471												
	$\beta_3$	1.82321													
	$\gamma_1$	0.688672	1.015027	1.293291		2.009						1.853			



Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands												Octupole band		Ref.
	C	$0^+(2^+)$	$2^+(3^+)$	$4^+(4^+)$	$6^+(5^+)$	$8^+(6^+)$	$10^+(7^+)$	$12^+(8^+)$	$14^+(9^+)$	$16^+(10^+)$	$18^+(11^+)$	R	$1^-/5^-$	$3^-/7^-$	
$^{196}_{78}\text{Pt}_{120}$	g	0	0.40721	0.98503	1.7147							2.419		1.6808	Pt-16
	$\beta_1$	0.9145	1.2795												
	$\beta_2$	1.4812													
	$\gamma_1$	0.77469	(1.24796)	(1.4453)								1.417			
$^{200}_{78}\text{Pt}_{122}$	g	0	0.466	1.099								2.358			Pt-17
	$\beta_1$	1.579	(1.757)												
	$\beta_2$	2.014													
	$\gamma_1$	0.863													
$^{180}_{80}\text{Hg}_{100}$	g	0	0.263												Hg-1
$^{182}_{80}\text{Hg}_{102}$	g	0	0.1707												Hg-1
	$\beta_1$	0.4219													
$^{184}_{80}\text{Hg}_{104}$	g	0	0.3667	1.0889								2.969			Hg-2, Hg-3
	$\beta_1$	0.3752	0.5348	0.5546	0.9947	1.4130	(1.9023)	(2.453)	(3.057)			1.751			
	g	0	0.4053	1.0806	1.6783							2.666			Hg-4, Hg-5
$^{186}_{80}\text{Hg}_{106}$	$\beta_1$	0.5230	0.6208	0.8079	1.1646	1.5887	2.0775	2.6195	3.2013	3.8123	4.4489	2.913			
	$\beta_2$	5.1158													
$^{188}_{80}\text{Hg}_{108}$	g	0	0.41289	1.00487	1.77726	2.4226	2.6623	2.7235	3.1609	3.8206	4.5810	2.434			Hg-6, Hg-7
	g	5.3050													
	$\beta_1$	0.8247	0.88108	1.2081	1.5092	1.9698	2.4910	3.0696	3.6890			6.800			
	$\gamma_1$	(0.9480)													
$^{190}_{80}\text{Hg}_{110}$	g	0	0.4165	1.0419	1.7734	2.4656	2.5975	2.6214	3.0413	3.7041	4.4933	2.502			Hg-8, Hg-9 Hg-10
	g	5.2301	(5.7963)	(6.5237)									1.8815	2.0783	
	$\gamma_1$	1.0999	1.6569	(2.2008)											
$^{192}_{80}\text{Hg}_{112}$	g	0	0.4228	1.0576	1.8030	2.4468	2.5069	2.5353	2.9516	3.6083	4.3891	2.501			Hg-10, Hg-11 Hg-12
	g	5.1305											1.8439	1.9769	
	$\gamma_1$	1.1133	1.5355	1.7329								1.469			
$^{194}_{80}\text{Hg}_{114}$	g	0	0.4279	1.0643	1.7990	2.3637	2.4233	2.4753	2.8882	3.5312	4.2748	2.486			Hg-10, Hg-11 Hg-13, Hg-14
	g	4.9851											1.8129	1.9099	
	$\beta_1$	1.500													
	$\gamma_1$	1.0734	1.4665												
$^{196}_{80}\text{Hg}_{116}$	g	0	0.4260	1.0615	1.7852	2.2628	2.3423	2.4390	2.8436	3.5074	4.3210	2.492			Hg-15, Hg-16
	$\beta_1$	(0.9581)											1.7571	1.8914	
	$\beta_2$	(1.3189)													
	$\gamma_1$	1.0362	(1.3906)												
$^{198}_{80}\text{Hg}_{118}$	g	0	0.411795	1.0485	1.8158	2.3379	2.4352	2.5782	2.9262	3.486	4.262	2.546		2.486	Hg-14, Hg-17 Hg-18, Hg-19
	g	(5.284)											2.113		
	$\beta_1$	1.4015	1.6124	(1.8472)											
	$\beta_2$	1.775													
	$\gamma_1$	1.08769	(1.4193)												
$^{200}_{80}\text{Hg}_{120}$	g	0	0.367944	0.947242	1.7068	2.680						2.574		2.609	Hg-19, Hg-20 Hg-21
	$\beta_1$	1.02934													
	$\beta_2$	1.51517													
	$\beta_3$	1.85678													
	$\gamma_1$	1.25410	1.65901												
$^{202}_{80}\text{Hg}_{122}$	g	0	0.439511	1.1199								2.548		2.709	Hg-19, Hg-22
	$\beta_1$	(1.5648)													
	$\beta_2$	(1.6432)													
	$\gamma_1$	0.95972	(1.5621)												
$^{204}_{80}\text{Hg}_{124}$	g	0	0.4366	(1.1283)								2.584		2.675	Hg-19, Hg-23
$^{206}_{80}\text{Hg}_{126}$	g	0	1.068	2.102								1.968			Hg-24
$^{188}_{82}\text{Pb}_{106}$	g	0	(0.368)												Pb-1
$^{190}_{82}\text{Pb}_{108}$	g	0	0.773	1.280	(1.820)							1.656			Pb-2
$^{192}_{82}\text{Pb}_{110}$	g	0	0.8515	1.3531	1.9185	2.5181						1.589			Pb-3
$^{194}_{82}\text{Pb}_{112}$	g	0	0.9659	1.5415								1.596			Pb-4
$^{196}_{82}\text{Pb}_{114}$	g	0	1.0486	(1.7366)								1.656			Pb-5

Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands										Octupole band			Ref.	
	C	$0^+(2^+)$	$2^+(3^+)$	$4^+(4^+)$	$6^+(5^+)$	$8^+(6^+)$	$10^+(7^+)$	$12^+(8^+)$	$14^+(9^+)$	$16^+(10^+)$	$18^+(11^+)$	R	$1^-/5^-$		$3^-/7^-$
$^{196}_{82}\text{Pb}_{118}$	g	0	1.0629	1.6249								1.529			Pb-4
$^{200}_{82}\text{Pb}_{118}$	g	0	1.0263	1.4883								1.450			Pb-4
$^{202}_{82}\text{Pb}_{120}$	g	0	0.96067	1.38285								1.439			Pb-6, Pb-7
	$\beta_1$		1.6562										2.04034	2.20845	
	$\beta_2$		1.8595												
	$\beta_3$		2.156												
	$\tau_1$		(1.584)												
$^{204}_{82}\text{Pb}_{122}$	g	0	0.89909	1.27379								1.417		2.617	Pb-8, Pb-9
	$\beta_1$		1.5827	1.958											
	$\beta_2$		1.728	2.102											
	$\tau_1$		1.35376	(1.60470)	1.81727	(2.06497)						1.847			
$^{206}_{82}\text{Pb}_{124}$	g	0	0.80310	1.68408								2.097		2.6479	Pb-10
	$\beta_1$		1.165	1.467	1.9977							2.757			
	$\tau_1$		1.789												
$^{208}_{82}\text{Pb}_{126}$	g	0	4.0847											(3.997)	Pb-11
	$\beta_1$		(4.6820)												
	$\beta_2$		(4.9049)												
	$\tau_1$		4.9352												
$^{210}_{82}\text{Pb}_{128}$	g	0	0.7997	1.0977	1.195	1.278						1.373		1.870	Pb-12
$\tau_1$		(2.214)													
$^{212}_{82}\text{Pb}_{130}$	g	0	0.806	1.117	1.277	1.335						1.386		1.820	Pb-13
$^{200}_{84}\text{Po}_{116}$	g	0	0.668	1.279	1.763							1.915			Po-1
$^{202}_{84}\text{Po}_{118}$	g	0	0.6774	1.2490	1.6919	1.712						1.844			Po-2
$^{204}_{84}\text{Po}_{120}$	g	0	0.6837	1.199	1.625	1.645	(2.533)					1.754			Po-3
$^{206}_{84}\text{Po}_{122}$	g	0	0.70066	1.1778	1.57337							1.681			Po-4
$\tau_1$		(1.1619)													
$^{208}_{84}\text{Po}_{124}$	g	0	0.690	1.351	1.524							1.958			Po-5
	$\beta_1$		1.273												
	$\tau_1$		1.428												
$^{210}_{84}\text{Po}_{126}$	g	0	1.1814	1.4267	1.4732	1.5568						1.208		2.3868	Po-6
$^{212}_{84}\text{Po}_{128}$	g	0	0.7278	1.1329	1.3562	1.4773						1.557			Po-7, Po-8
	$\beta_1$		1.8010												
	$\tau_1$		1.51266												
$^{214}_{84}\text{Po}_{130}$	g	0	0.6094												
	$\beta_1$		1.4158												
	$\tau_1$		1.3781	(1.5442)											
$^{216}_{84}\text{Po}_{132}$	g	0	0.5497												
$^{218}_{84}\text{Po}_{134}$	g	0	0.512												Po-9
$^{204}_{86}\text{Rn}_{118}$	g	0	0.5429	1.1314	1.8062	2.1051						2.084			Rn-1
$^{206}_{86}\text{Rn}_{120}$	g	0	0.5754	1.1345	1.7633	1.9246						1.972			Rn-1
$^{208}_{86}\text{Rn}_{122}$	g	0	0.6358	1.4143	1.7396	1.8283	2.4650	3.1107	3.4689			2.224			Rn-2
$^{210}_{86}\text{Rn}_{124}$	g	0	0.6438	1.4614	1.6645	1.6645+ $\Delta$	2.3767+ $\Delta$	2.9223+ $\Delta$	3.2476+ $\Delta$			2.270			Rn-3
$^{212}_{86}\text{Rn}_{126}$	g	0	1.2737	1.5013	1.6394	(1.670)	(2.631)	(2.858)	(3.334)			1.179			Rn-4
$^{214}_{86}\text{Rn}_{128}$	g	0	0.694	1.140	1.442	1.625	1.787	2.734				1.643			Rn-5
$^{216}_{86}\text{Rn}_{130}$	g	0	(0.465)												Rn-6
$^{218}_{86}\text{Rn}_{132}$	g	0	0.32422	(0.6526)								2.013	(0.8400)	(0.7967)	Rn-7, Rn-8
$^{220}_{86}\text{Rn}_{134}$	g	0	0.24089	(0.5337)								2.256	(0.645)	(0.663)	Rn-8, Rn-9
$^{222}_{86}\text{Rn}_{136}$	g	0	0.18599	(0.448)								2.409	(0.601)	(0.636)	Rn-8, Rn-10
$\beta_1$		(0.44826)													
$^{214}_{88}\text{Ra}_{128}$	g	0	1.3812	1.6371	1.8165	1.8635	2.942	3.253	3.974			1.185			Ra-1
$^{216}_{88}\text{Ra}_{130}$	g	0	0.6866	1.1613	1.5048	1.7083	2.0328	2.9435	3.2880			1.691			Ra-2
$^{218}_{88}\text{Ra}_{132}$	g	0	0.3522	0.7411	1.1220	1.5467	1.9617	2.3911	2.8258	3.285		2.104	(0.704)	(0.818)	Ra-3, Ra-4
$\tau_1$													1.0383	1.3409	

Nucleus	Quasi-ground (g), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands										Octupole band		Ref.		
	C	$0^+(2^+)$	$2^+(3^+)$	$4^+(4^+)$	$6^+(5^+)$	$8^+(6^+)$	$10^+(7^+)$	$12^+(8^+)$	$14^+(9^+)$	$16^+(10^+)$	$18^+(11^+)$	R		$1^7/5^-$	$3^-/7^-$
$^{220}_{86}\text{Ra}_{132}$	g	0	0.177	(0.474)								2.678	(0.410)		Ra-5
$^{222}_{86}\text{Ra}_{134}$	g	0	0.11112	0.30142								2.713	0.24213	0.31735	Ra-6
	$\beta_1$	0.9140	(1.0250)										(0.4737)		
$^{224}_{86}\text{Ra}_{136}$	g	0	0.084371	0.250778								2.972	0.215980	0.29033	Ra-7
	$\beta_1$	0.91637	(0.9925)										0.43308		
	$\gamma_1$	0.96545													
$^{226}_{86}\text{Ra}_{138}$	g	0	0.067672	0.211544								3.126	0.253727	(0.3216)	Ra-7
	$\beta_1$	(0.8246)	(0.8738)										(0.4462)		
$^{228}_{86}\text{Ra}_{140}$	g	0	0.06383	0.20469	0.41167							3.207	0.47414	0.53757	Ra-8
	$\beta_1$	0.72117	0.77070	0.88030								3.213	0.65596		
	$\beta_2$	1.0419	1.08730												
	$\gamma_1$	0.8462	0.8989												
	$\gamma_2$	1.0133	1.0703												
$^{222}_{90}\text{Th}_{132}$	g	0	0.1833	0.4398	0.7500	1.0936	1.4615	1.8510	2.2603	2.691		2.399			Th-1,Th-2
$^{224}_{90}\text{Th}_{134}$	g	0	(0.093)	(0.280)								3.011	(0.246)		
$^{226}_{90}\text{Th}_{136}$	g	0	0.07220	0.22643	0.4503							3.136	0.23037	0.3076	Th-2
	$\beta_1$	(0.8052)	(0.847)										(0.4503)		
$^{228}_{90}\text{Th}_{138}$	g	0	0.05776	0.1869	0.3782							3.236	0.3277	0.3962	Th-3
	$\beta_1$	0.8314	0.8740										0.51928		
	$\gamma_1$	0.9688	(1.0223)	(1.0912)								2.288			
$^{230}_{90}\text{Th}_{140}$	g	0	0.05320	0.17408	0.3566	0.5941	0.8797	1.2078	1.5729	1.9715	2.3978	3.272	0.50817	0.57177	Th-4,Th-5
	$\beta_1$	2.850	3.325	3.809									0.6867	0.8524	
	$\beta_2$	0.6346	0.6777	0.7695								3.130			
	$\gamma_1$	1.590	1.636												
	$\gamma_2$	0.7813	0.8258	(0.881)								2.240			
$^{226}_{90}\text{Th}_{142}$	g	0	0.049369	0.16212	0.3332	0.5569	0.8270	1.1374	1.4828	1.8589	2.2629	3.284	0.71425	0.7744	Th-5,Th-6
	$\beta_1$	2.6919	3.1449	3.619	4.1169	4.6329	5.161						0.8836	1.0429	
	$\beta_2$	0.73035	0.7741	0.8730	1.0234	1.2215	1.4670	1.7528	2.073			3.261			
	$\beta_3$	1.0787	1.1228												
	$\beta_4$	1.3035	1.3872												
	$\gamma_1$	0.7851	0.8295	0.8903	0.9600	1.0507	1.1423	1.2603	1.3700	1.5126	1.6398	2.369			
$\gamma_2$	1.8003	1.947	2.123												
$^{234}_{90}\text{Th}_{144}$	g	0	0.04955	0.160	(0.331)	(0.555)						3.229			Th-7,Th-8
$^{226}_{92}\text{U}_{136}$	g	0	0.059												U-1
$^{230}_{92}\text{U}_{138}$	g	0	0.05172	0.1676								3.241	(0.36656)	(0.4212)	U-2
$^{232}_{92}\text{U}_{140}$	g	0	0.047574	0.156571	0.3223	0.5407	0.8055	1.1112	1.4535	1.8280	(2.2315)	3.291	0.56320	0.62897	U-3
	$\beta_1$	0.6911	0.73457	0.8330	0.9852	1.1873	1.4349					3.264			
	$\gamma_1$	0.866793	0.91142	(0.97069)								3.238			
$^{234}_{92}\text{U}_{142}$	g	0	0.04348	0.14332	0.29603	0.4966	0.7404	1.0233	1.3401	1.6873	2.0623	3.296	0.78628	0.8493	U-4,U-5
	$\beta_1$	2.4635	2.889	3.338	3.807	4.296							0.9626	1.1225	U-6
	$\beta_2$	0.80989	0.85172	0.94784	1.0958	1.2926						3.298			
	$\beta_3$	1.04451	1.0857												
	$\gamma_1$	0.92671	0.9691	1.0237	1.0926	1.1724						2.288			
$\gamma_2$	1.12630	1.1656	1.2149	1.2746	1.3540						2.252				
$^{236}_{92}\text{U}_{144}$	g	0	0.045242	0.149475	0.309785	0.52225	0.7828	1.0862	1.4245	1.7991	2.2021	3.301	0.68761	0.7442	U-3
	$\beta_1$	2.6299	3.0791	3.5484	4.0379	4.548	5.078						0.8476	1.002	
	$\beta_2$	0.91916	(0.9604)	(1.0512)								3.202			
	$\gamma_1$	(0.9581)	(1.0014)	(1.0587)	(1.1262)							2.323			
$^{238}_{92}\text{U}_{146}$	g	0	0.044925	0.148414	0.307214	0.5178	0.7757	1.0765	1.4153	1.7882	2.1907	3.304	0.6801	0.7319	U-7,U-8
	$\beta_1$	2.6187	3.0672	3.5345	4.0172	4.5165	5.0342						0.8271	0.9559	
	$\beta_2$	(0.9270)	0.9663	(1.055)								3.257			
	$\beta_3$	0.993	1.0373	(1.127)	(1.270)							3.025			
	$\gamma_1$	1.0603	(1.1056)	(1.1677)								2.371			

Nucleus	Quasi-ground ( $g$ ), Quasi-beta ( $\beta$ ) and Quasi-gamma ( $\gamma$ ) bands											Octupole band		Ref.	
	C	$0^+(2^+)$	$2^+(3^+)$	$4^+(4^+)$	$6^+(5^+)$	$8^+(6^+)$	$10^+(7^+)$	$12^+(8^+)$	$14^+(9^+)$	$16^+(10^+)$	$18^+(11^+)$	R	$1^-/5^-$		$3^-/7^-$
$^{240}_{92}\text{U}_{148}$	$g$	0	0.045	0.151								3.356			U-9
$^{236}_{84}\text{Pu}_{142}$	$g$	0	0.0446	0.146	0.307							3.274			Pu-1
$^{238}_{94}\text{Pu}_{144}$	$g$	0	0.04408	0.14598	0.30340	0.514						3.312	0.60516	0.66146	Pu-2, Pu-3
	$\beta_1$	0.94145	0.98309										0.76327		Pu-4
	$\beta_2$	1.22867	1.2643												
	$\beta_3$	1.4266	1.4585												
	$\gamma_1$	1.02855	1.06995												
$^{240}_{94}\text{Pu}_{140}$	$g$	0	0.042825	0.141686	0.294314	0.4976	0.7514					3.309	0.59736	0.64889	Pu-5, Pu-6
	$\beta_1$	0.86070	0.90032	(0.9926)								3.329	0.7425		Pu-7
	$\beta_2$	1.08971	1.1309												
	$\beta_3$	1.5259	1.5589												
	$\gamma_1$	1.1375	(1.1778)	1.2324								2.355			
$^{242}_{94}\text{Pu}_{148}$	$g$	0	0.04454	0.1473	0.3060	0.5177	0.7782	1.0840	1.4313	1.8163	2.2356	3.307	(0.7803)	0.8323	Pu-8, Pu-9
	$\beta$	2.6858	3.1630	3.6622	4.1722								(0.927)		
	$\beta_1$	0.956	0.995												
	$\gamma_1$	1.102													
$^{244}_{94}\text{Pu}_{150}$	$g$	0	0.0460	0.1560	0.3184	0.5348	0.8013	1.1137	1.4674	1.8584	2.2822	3.391		0.957	Pu-9, Pu-10
	$\gamma_1$	2.7337	3.2057	3.6777	4.1354										
$^{246}_{94}\text{Pu}_{152}$	$g$	0	0.046	0.135								3.35			Pu-11
	$\beta_1$	0.991													
$\gamma_1$	(1.040)														
$^{242}_{96}\text{Cm}_{146}$	$g$	0	0.04212	0.139	0.285							3.30			
$^{244}_{96}\text{Cm}_{148}$	$g$	0	0.0429	0.1423	0.2960	0.5014						3.317			
$^{248}_{96}\text{Cm}_{150}$	$g$	0	0.042852	0.14201	0.2949	0.5004						3.314	1.24978	(1.30044)	Cm-1, Cm-2
	$\beta_1$	1.17474	1.21053												
	$\beta_2$	1.2894	(1.31757)	(1.37923)								3.191			
	$\gamma_1$	1.12427	1.16549	(1.21990)								2.320			
$^{248}_{96}\text{Cm}_{152}$	$g$	0	0.04340	0.1440	0.2986	0.5055	0.7613	1.0621	1.4036	1.7809	2.1891	3.318			Cm-1, Cm-3
	$\beta$	2.6230	3.0787	3.5541	4.0491	4.5654	(5.1072)								Cm-4
	$\beta_1$	1.084	(1.126)	(1.222)								3.286			
	$\gamma_1$	(1.050)		(1.144)											
$^{250}_{96}\text{Cm}_{154}$	$g$	0	0.043												Cm-1
$^{244}_{98}\text{Cf}_{148}$	$g$	0	0.040												Cf-1
$^{248}_{98}\text{Cf}_{150}$	$g$	0	0.0415												Cf-2
$^{250}_{98}\text{Cf}_{152}$	$g$	0	0.042722	0.141886	0.29625	0.500						3.321	1.17552	(1.2111)	Cf-3, Cf-4
	$\beta_1$	1.15423	1.18940												Cf-5
	$\beta_2$	1.26665	1.29664												
	$\gamma_1$	1.031854	1.07138	(1.123)								2.305			
	$\gamma_2$	1.24451													
$\gamma_3$	1.65799	(1.69517)													
$^{252}_{98}\text{Cf}_{154}$	$g$	0	0.04572	0.15174								3.319			Cf-1, Cf-6
	$\gamma_1$	0.80482	0.84572	0.9003								2.335			
$^{250}_{100}\text{Fm}_{150}$	$g$	0	0.044												Fm-1
$^{252}_{100}\text{Fm}_{152}$	$g$	0	0.045												Fm-1
$^{254}_{100}\text{Fm}_{154}$	$g$	0	0.044988	0.149347								3.320			Fm-1
	$\gamma_1$	0.69379	(0.73367)												
$^{256}_{100}\text{Fm}_{156}$	$g$	0	0.0461	0.1595	0.3321	0.5635						3.460			Fm-1

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