^{128}Te(^{27}Al,6nγ):SD 1998Kh09

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 185, 2 (2022)	23-Aug-2022

Also includes ^{124}Sn(^{31}P,6nγ) from 2002By01.

1998Kh09: E=150 MeV ^{27}Al beam was produced from the 88-inch cyclotron at LBNL. Target was 1 mg/cm^2 ^{128}Te evaporated onto a 15 mg/cm^2 gold foil. γ rays were detected with the Gammasphere spectrometer with 95 operational Ge detectors. Measured γ, $\gamma\gamma$-coin, $\gamma\gamma\gamma$-coin, Doppler-shift attenuation. Deduced levels, J, super- deformed (SD) band structures, quadrupole moments, configurations. Five SD bands deduced.

2002By01: ^{124}Sn(^{31}P,6nγ) E=167 MeV from the VIVITRON accelerator of the Institut de Recherches Subatomiques in Strasbourg. γ rays were detected with the EUROBALL IV array. Measured population of SD bands relative to that of levels in the first potential well.

All data are from 1998Kh09.

^{149}Tb Levels

σ(SD bands)/σ(normal bands)=2.0 *3* (2002By01), interpreted as enhanced population in the reaction used.

E(level)	J$^\pi$†	E(level)	J$^\pi$†	E(level)	J$^\pi$†	E(level)	J$^\pi$†
x‡	J1	2890.7+y# *5*	J2+8	3454.9+z@ *5*	J3+8	10622.9+u& *9*	J4+20
740.1+x‡ *2*	J1+2	3741.2+y# *6*	J2+10	4447.5+z@ *6*	J3+10	11976.9+u& *10*	J4+22
1534.8+x‡ *3*	J1+4	4643.2+y# *6*	J2+12	5491.4+z@ *7*	J3+12	13382.3+u& *11*	J4+24
2381.9+x‡ *5*	J1+6	5597.3+y# *7*	J2+14	6587.2+z@ *7*	J3+14	14832.8+u& *11*	J4+26
3281.3+x‡ *5*	J1+8	6603.6+y# *7*	J2+16	7735.6+z@ *7*	J3+16	v[a]	J5
4234.8+x‡ *5*	J1+10	7662.4+y# *8*	J2+18	8935.6+z@ *8*	J3+18	803.6+v[a] *4*	J5+2
5242.0+x‡ *6*	J1+12	8774.1+y# *8*	J2+20	10187.6+z@ *8*	J3+20	1657.0+v[a] *5*	J5+4
6302.7+x‡ *7*	J1+14	9938.6+y# *8*	J2+22	11490.6+z@ *9*	J3+22	2564.8+v[a] *6*	J5+6
7416.9+x‡ *7*	J1+16	11156.5+y# *9*	J2+24	12847.3+z@ *10*	J3+24	3523.1+v[a] *7*	J5+8
8586.1+x‡ *8*	J1+18	12427.9+y# *9*	J2+26	u&	J4	4532.8+v[a] *7*	J5+10
9810.7+x‡ *8*	J1+20	13752.8+y# *9*	J2+28	824.0+u&	J4+2	5593.5+v[a] *7*	J5+12
11089.5+x‡ *8*	J1+22	15131.5+y# *9*	J2+30	1701.4+u& *5*	J4+4	6706.2+v[a] *8*	J5+14
12423.9+x‡ *9*	J1+24	16565.0+y# *10*	J2+32	2633.3+u& *6*	J4+6	7873.0+v[a] *8*	J5+16
13815.0+x‡ *9*	J1+26	18052.7+y# *10*	J2+34	3619.0+u& *7*	J4+8	9092.7+v[a] *9*	J5+18
15259.2+x‡ *10*	J1+28	19594.6+y# *11*	J2+36	4656.6+u& *7*	J4+10	10364.5+v[a] *10*	J5+20
y#	J2	z@	J3	5744.9+u& *8*	J4+12	11692.1+v[a] *11*	J5+22
646.2+y# *3*	J2+2	786.0+z@ *3*	J3+2	6884.9+u& *8*	J4+14	13075.3+v[a] *12*	J5+24
1343.6+y# *4*	J2+4	1623.3+z@ *5*	J3+4	8077.9+u& *8*	J4+16		
2091.7+y# *5*	J2+6	2513.9+z@ *5*	J3+6	9322.9+u& *9*	J4+18		

† Proposed by 1998Kh09 based on band assignments.

‡ Band(A): SD-1 Band. Q(intrinsic)=15.3 *2* (1998Kh09). Intruder configuration=$\pi 6^3 \otimes \nu 7^1 \otimes (\nu 1/2[651], \alpha=+1/2)^{-1}$ (1998Kh09).

Band(B): SD-2 Band. Q(intrinsic)=15.8 *+4−3* (1998Kh09). Intruder configuration=$\pi 6^3 \otimes \nu 7^1 \otimes (\nu 1/2[651], \alpha=-1/2$ or $\nu 2[642], \alpha=-1/2)^{-1}$ (1998Kh09).

@ Band(C): SD-3 Band. Q(intrinsic)=16.4 *+3−4* (1998Kh09). Intruder configuration=$\pi 6^4 \otimes \pi 1/2[301]^{-1} \otimes \nu 7^1 \otimes \nu 1/2[651]^{-1}$ (1998Kh09).

& Band(D): SD-4 Band. Q(intrinsic)=16.0 *+6−5* (1998Kh09). Intruder configuration=$\pi 6^4 \otimes \pi 6_3^{-1} \otimes \nu 7^1 \otimes \nu 1/2[642]^{-1}$ (1998Kh09).

a Band(E): SD-5 Band. Band from 1998Kh09.

^{128}Te(^{27}Al,6nγ):SD 1998Kh09 (continued)

$\gamma(^{149}Tb)$

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π
646.2 *3*	0.31 *5*	646.2+y	J2+2	y	J2
697.4 *2*	0.97 *3*	1343.6+y	J2+4	646.2+y	J2+2
740.1 *2*	0.42 *4*	740.1+x	J1+2	x	J1
748.2 *2*	1.00 *2*	2091.7+y	J2+6	1343.6+y	J2+4
786.0 *3*	0.75 *6*	786.0+z	J3+2	z	J3
794.7 *2*	0.65 *4*	1534.8+x	J1+4	740.1+x	J1+2
799.0 *2*	1.02 *2*	2890.7+y	J2+8	2091.7+y	J2+6
803.7 *4*		803.6+v	J5+2	v	J5
824.0[‡]	0.57 *4*	824.0+u	J4+2	u	J4
837.4 *3*	0.93 *5*	1623.3+z	J3+4	786.0+z	J3+2
847.1 *3*	1.00 *9*	2381.9+x	J1+6	1534.8+x	J1+4
850.5 *3*	1.05 *2*	3741.2+y	J2+10	2890.7+y	J2+8
853.4 *3*		1657.0+v	J5+4	803.6+v	J5+2
877.4 *4*	0.93 *7*	1701.4+u	J4+4	824.0+u	J4+2
890.6 *2*	1.02 *4*	2513.9+z	J3+6	1623.3+z	J3+4
899.4 *2*	1.02 *9*	3281.3+x	J1+8	2381.9+x	J1+6
902.0 *2*	1.05 *3*	4643.2+y	J2+12	3741.2+y	J2+10
907.8 *3*		2564.8+v	J5+6	1657.0+v	J5+4
931.9 *4*	1.00 *4*	2633.3+u	J4+6	1701.4+u	J4+4
941.0 *2*	1.00 *4*	3454.9+z	J3+8	2513.9+z	J3+6
953.5 *2*	1.01 *8*	4234.8+x	J1+10	3281.3+x	J1+8
954.1 *3*	1.03 *2*	5597.3+y	J2+14	4643.2+y	J2+12
958.3 *2*		3523.1+v	J5+8	2564.8+v	J5+6
985.7 *3*	1.00 *4*	3619.0+u	J4+8	2633.3+u	J4+6
992.7 *3*	1.01 *4*	4447.5+z	J3+10	3454.9+z	J3+8
1006.3 *2*	0.98 *2*	6603.6+y	J2+16	5597.3+y	J2+14
1007.2 *2*	0.98 *8*	5242.0+x	J1+12	4234.8+x	J1+10
1009.7 *2*		4532.8+v	J5+10	3523.1+v	J5+8
1037.6 *2*	1.07 *5*	4656.6+u	J4+10	3619.0+u	J4+8
1043.9 *2*	1.00 *4*	5491.4+z	J3+12	4447.5+z	J3+10
1058.8 *2*	1.00 *2*	7662.4+y	J2+18	6603.6+y	J2+16
1060.7 *3*	1.00 *8*	6302.7+x	J1+14	5242.0+x	J1+12
1060.7 *2*		5593.5+v	J5+12	4532.8+v	J5+10
1088.3 *3*	1.04 *4*	5744.9+u	J4+12	4656.6+u	J4+10
1095.8 *2*	1.00 *4*	6587.2+z	J3+14	5491.4+z	J3+12
1111.7 *2*	1.02 *2*	8774.1+y	J2+20	7662.4+y	J2+18
1112.7 *3*		6706.2+v	J5+14	5593.5+v	J5+12
1114.2 *2*	1.02 *7*	7416.9+x	J1+16	6302.7+x	J1+14
1140.0 *2*	1.02 *3*	6884.9+u	J4+14	5744.9+u	J4+12
1148.4 *2*	1.00 *4*	7735.6+z	J3+16	6587.2+z	J3+14
1164.5 *3*	0.96 *2*	9938.6+y	J2+22	8774.1+y	J2+20
1166.8 *3*		7873.0+v	J5+16	6706.2+v	J5+14
1169.2 *3*	0.95 *7*	8586.1+x	J1+18	7416.9+x	J1+16
1193.0 *2*	1.00 *3*	8077.9+u	J4+16	6884.9+u	J4+14
1200.0 *3*	0.98 *6*	8935.6+z	J3+18	7735.6+z	J3+16
1217.9 *2*	0.94 *2*	11156.5+y	J2+24	9938.6+y	J2+22
1219.7 *4*		9092.7+v	J5+18	7873.0+v	J5+16
1224.6 *2*	0.77 *6*	9810.7+x	J1+20	8586.1+x	J1+18
1245.0 *3*	0.98 *4*	9322.9+u	J4+18	8077.9+u	J4+16
1252.0 *2*	0.87 *5*	10187.6+z	J3+20	8935.6+z	J3+18
1271.4 *2*	0.82 *2*	12427.9+y	J2+26	11156.5+y	J2+24
1271.8 *4*		10364.5+v	J5+20	9092.7+v	J5+18
1278.8 *3*	0.68 *5*	11089.5+x	J1+22	9810.7+x	J1+20
1300.0 *3*	0.79 *6*	10622.9+u	J4+20	9322.9+u	J4+18
1303.0 *3*	0.65 *5*	11490.6+z	J3+22	10187.6+z	J3+20
1324.9 *2*	0.60 *2*	13752.8+y	J2+28	12427.9+y	J2+26

Continued on next page (footnotes at end of table)

^{128}Te(^{27}Al,6nγ):SD 1998Kh09 (continued)

$\gamma(^{149}Tb)$ (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π
1327.6 *5*		11692.1+v	J5+22	10364.5+v	J5+20
1334.4 *3*	0.49 *5*	12423.9+x	J1+24	11089.5+x	J1+22
1354.0 *3*	0.51 *4*	11976.9+u	J4+22	10622.9+u	J4+20
1356.7 *4*	0.32 *5*	12847.3+z	J3+24	11490.6+z	J3+22
1378.7 *2*	0.54 *2*	15131.5+y	J2+30	13752.8+y	J2+28
1383.2 *5*		13075.3+v	J5+24	11692.1+v	J5+22
1391.1 *3*	0.41 *3*	13815.0+x	J1+26	12423.9+x	J1+24
1405.4 *4*	0.43 *5*	13382.3+u	J4+24	11976.9+u	J4+22
1433.5 *3*	0.29 *2*	16565.0+y	J2+32	15131.5+y	J2+30
1444.2 *4*	0.13 *1*	15259.2+x	J1+28	13815.0+x	J1+26
1450.5 *4*	0.33 *5*	14832.8+u	J4+26	13382.3+u	J4+24
1487.7 *3*	0.21 *3*	18052.7+y	J2+34	16565.0+y	J2+32
1541.9 *4*	0.10 *2*	19594.6+y	J2+36	18052.7+y	J2+34

[†] Relative intensities within each band (1998Kh09).
[‡] Placement of transition in the level scheme is uncertain.

^{128}Te(^{27}Al,6nγ):SD 1998Kh09

Level Scheme

Intensities: Relative I_γ

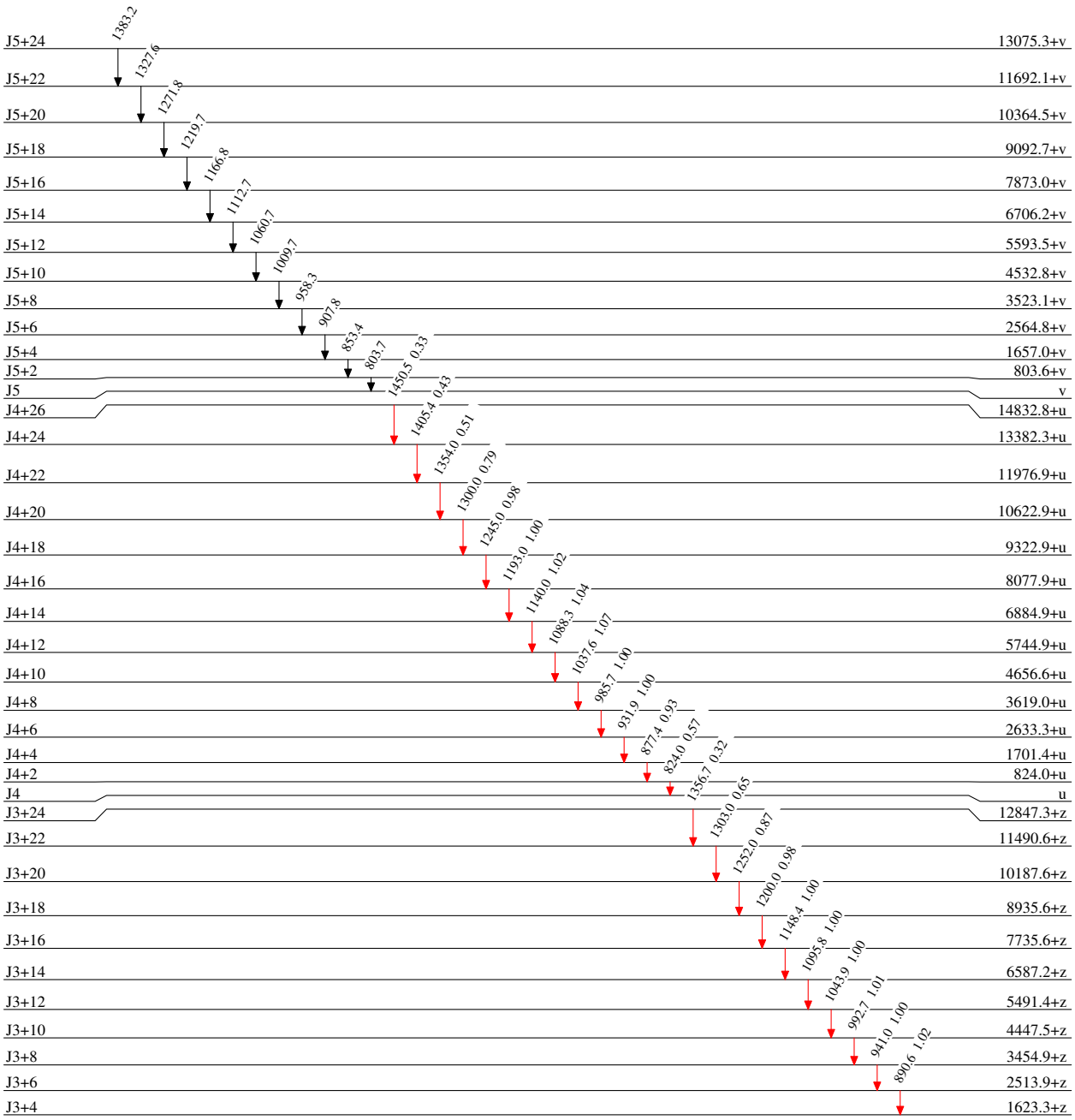
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$

γ Decay (Uncertain)



$^{149}_{65}Tb_{84}$

^{128}Te(^{27}Al,6nγ):SD 1998Kh09

Level Scheme (continued)

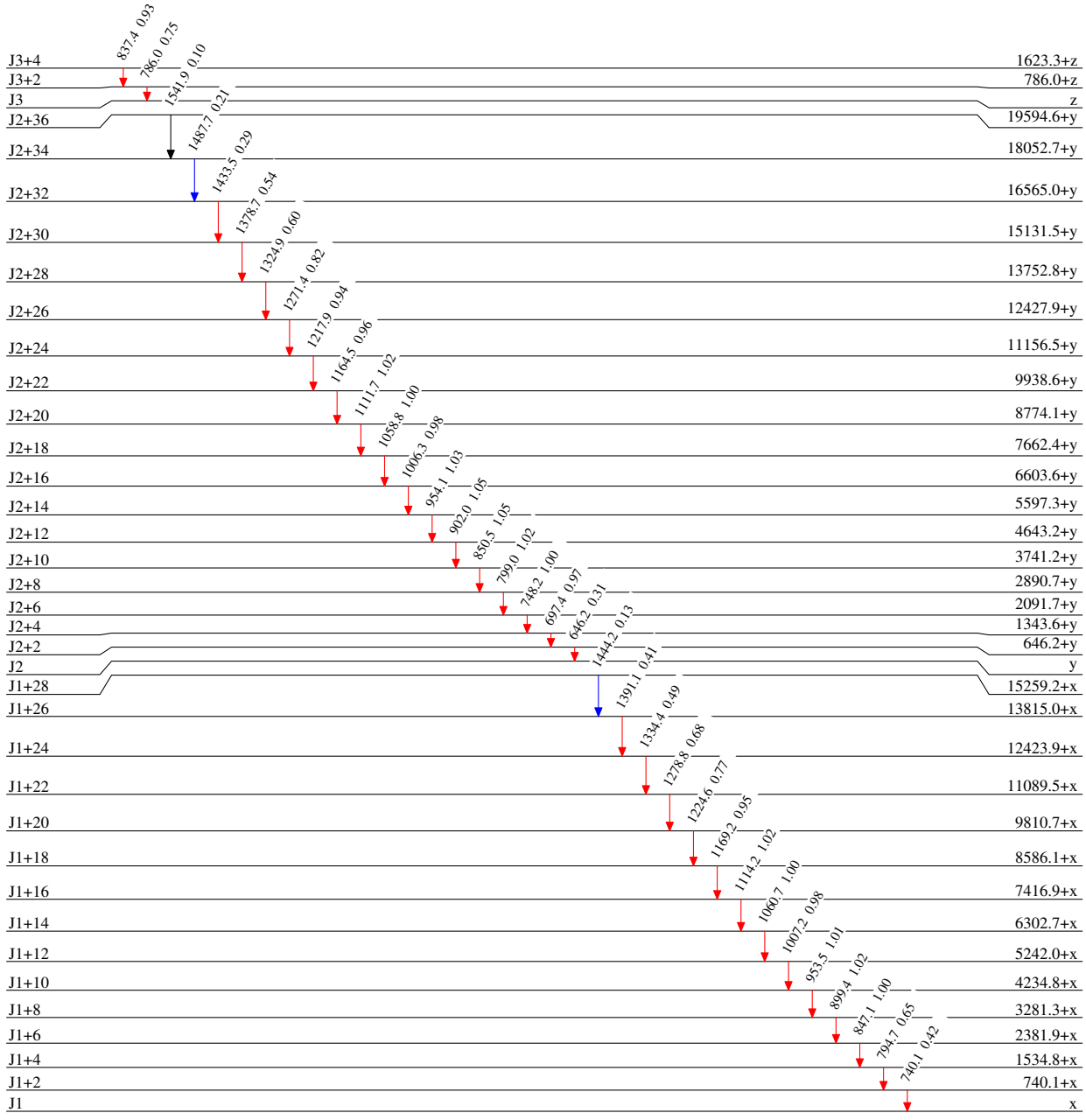
Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



$^{149}_{65}Tb_{84}$

^{128}Te(^{27}Al,6nγ):SD 1998Kh09

Band(D): SD-4 Band

J4+26		14832.8+u
J4+24	1450	13382.3+u
J4+22	1405	11976.9+u
J4+20	1354	10622.9+u
J4+18	1300	9322.9+u
J4+16	1245	8077.9+u
J4+14	1193	6884.9+u
J4+12	1140	5744.9+u
J4+10	1088	4656.6+u
J4+8	1038	3619.0+u
J4+6	986	2633.3+u
J4+4	932	1701.4+u
J4+2	877	824.0+u
J4	824	u

Band(C): SD-3 Band

J3+24		12847.3+z
J3+22	1357	11490.6+z
J3+20	1303	10187.6+z
J3+18	1252	8935.6+z
J3+16	1200	7735.6+z
J3+14	1148	6587.2+z
J3+12	1096	5491.4+z
J3+10	1044	4447.5+z
J3+8	993	3454.9+z
J3+6	941	2513.9+z
J3+4	891	1623.3+z
J3+2	837	786.0+z
J3	786	z

Band(B): SD-2 Band

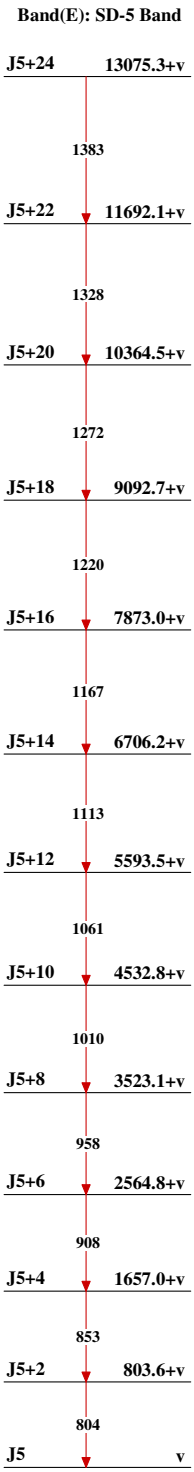
J2+36		19594.6+y
J2+34	1542	18052.7+y
J2+32	1488	16565.0+y
J2+30	1434	15131.5+y
J2+28	1379	13752.8+y
J2+26	1325	12427.9+y
J2+24	1271	11156.5+y
J2+22	1218	9938.6+y
J2+20	1164	8774.1+y
J2+18	1112	7662.4+y
J2+16	1059	6603.6+y
J2+14	1006	5597.3+y
J2+12	954	4643.2+y
J2+10	902	3741.2+y
J2+8	850	2890.7+y
J2+6	799	2091.7+y
J2+4	748	1343.6+y
J2+2	646	646.2+y
J2		y

Band(A): SD-1 Band

J1+28		15259.2+x
J1+26	1444	13815.0+x
J1+24	1391	12423.9+x
J1+22	1334	11089.5+x
J1+20	1279	9810.7+x
J1+18	1225	8586.1+x
J1+16	1169	7416.9+x
J1+14	1114	6302.7+x
J1+12	1061	5242.0+x
J1+10	1007	4234.8+x
J1+8	954	3281.3+x
J1+6	899	2381.9+x
J1+4	847	1534.8+x
J1+2	795	740.1+x
J1	740	x

$^{149}_{65}Tb_{84}$

^{128}Te(^{27}Al,6nγ):SD 1998Kh09 (continued)



$^{149}_{65}Tb_{84}$