$^{147}_{63}$Eu

Δ: −77555 *4* **S_n:** 8498 *7* **S_p:** 3838 *4*
Q_{EC}: 1721.3 *23* **Q_α:** 2990 *3*

Nuclear Bands

A $\pi h_{11/2}$
B SD band (97HaAA)

Levels and γ-ray branchings:

0, $5/2^+$, 24.1 *6* d, %α=0.0022 *6*, %EC=99.9978 *6*, μ=+3.724 *8*, Q=+0.55 *3*

229.32 *3*, $7/2^+$, 0.18 *2* ns γ_0***229.32*** *2* ($\dagger_\gamma$100 *30*) M1+E2: δ=+0.13 *2*

A **625.3** *2*, $11/2^-$, 0.765 *15* μs, μ=+7.05 *3* γ_{229}***396.00*** *10* ($\dagger_\gamma$100 *5*) M2 γ_0***625.18*** *10* ($\dagger_\gamma$13.6 *9*) E3

755.1 *1*, $(3/2)^+$ γ_0***755.01*** *10* ($\dagger_\gamma$100) (M1)

776.4 *2*, $9/2^+$ γ_{229}***547.3*** *3* ($\dagger_\gamma$7.0 *12*) M1 γ_0***776.33*** *10* ($\dagger_\gamma$100 *5*) E2

778.05 *1*, $7/2^+$ γ_{229}***549.2*** *5* ($\dagger_\gamma$1.5 *12*) γ_0***778.04*** *5* ($\dagger_\gamma$100 *4*) M1(+E2): δ=0.6 *3*

827.8, $(3/2)^+$ γ_0***827.8*** ($\dagger_\gamma$100) M1

861.63 *1*, $(7/2)^+$ γ_{755}***106.52*** *2* ($\dagger_\gamma$5.4 *18*) M1+E2 γ_{229}***632.35*** *10* ($\dagger_\gamma$98 *4*) M1 γ_0***861.7*** *1* ($\dagger_\gamma$100 *4*) M1+E2: δ=1.3 *3*

995.15 *1*, $9/2^-$ γ_{778}***217.2*** *1* ($\dagger_\gamma$3.0 *10*) E1 γ_{625}***370.0*** *1* ($\dagger_\gamma$100 *4*) M1+E2: δ=+0.07 *3* γ_{229}***765.81*** *10* ($\dagger_\gamma$66 *4*) E1

995.5, $(1/2)^+$ γ_0***995.5*** ($\dagger_\gamma$100) (E2)

1011.8, $9/2^+$ γ_{229}***782.4*** ($\dagger_\gamma$100) M1+E2

1033.8 *5*, $11/2^+$ γ_{776}***257.5*** γ_{229}***804.5*** *5* ($\dagger_\gamma$100) E2

1069.4 *1*, $7/2^-$ γ_{778}***291.7*** *2* ($\dagger_\gamma$2.8 *6*) (E1) γ_0***1069.35*** *10* ($\dagger_\gamma$100 *7*) E1

1122.8 *1*, $(9/2)^+$ γ_{862}***261.1*** *1* ($\dagger_\gamma$24.4 *12*) M1(+E2) γ_{776}***346.3*** *3* ($\dagger_\gamma$26.3 *10*) M1 γ_{229}***893.5*** *1* ($\dagger_\gamma$100 *5*) M1+E2 γ_0***1122.9*** *1* ($\dagger_\gamma$11.2 *6*) E2

1213.0 *2*, $5/2^-$ γ_{755}***458.0*** *5* ($\dagger_\gamma$30 *30*) γ_{229}***983.4*** *4* ($\dagger_\gamma$100 *12*) E1 γ_0***1213.0*** *2* ($\dagger_\gamma$70 *5*) E1

1235.7 *1*, $7/2^-$ γ_{1069}***166.34*** *10* ($\dagger_\gamma$20 *5*) M1+E2: δ=0.58 *5* γ_{995}***240.64*** *5* ($\dagger_\gamma$97 *5*) M1 γ_{625}***610.43*** *10* ($\dagger_\gamma$100 *9*) E2 γ_{229}***1006.4*** *1* ($\dagger_\gamma$86 *5*) E1 γ_0***1235.7*** *1* ($\dagger_\gamma$73 *5*) E1

1244.3 *2*, $(11/2)^-$ γ_{995}***249.15*** *10* ($\dagger_\gamma$11.0 *6*) M1(+E2) γ_{625}***619.00*** *10* ($\dagger_\gamma$100 *4*) M1+E2: δ=0.79 *17*

1289.0 *5*, $(11/2^-)$ γ_{995}***294.5*** (M1) γ_{776}***513.0*** *5*

1339.4 *5*, $11/2^-$ γ_{1012}***327.9*** E1 γ_{995}***344.2*** ($\dagger_\gamma$1.4) M1 γ_{625}***714***

A **1346.5** *4*, $15/2^-$ γ_{625}***721.0*** *5* ($\dagger_\gamma$100) E2

1360.2 *2*, $9/2^-$ γ_{776}***584.6*** *6* ($\dagger_\gamma$0.5 *3*) γ_{625}***734.4*** *4* ($\dagger_\gamma$2.6 *8*) (M1) γ_{229}***1130.9*** *1* ($\dagger_\gamma$100 *7*) E1 γ_0***1360*** ($\dagger_\gamma$<0.13)

1378.2 *2* γ_{862}***516.6*** *10* ($\dagger_\gamma$8 *3*) γ_{229}***1149.10*** *15* ($\dagger_\gamma$100 *8*) E2 γ_0***1377.7*** *3* ($\dagger_\gamma$12.2 *14*)

1389.5 *2*, $7/2^-$ γ_{1213}***176.7*** *1* ($\dagger_\gamma$5.2 *13*) (M1) γ_{229}***1160.15*** *15* ($\dagger_\gamma$100 *6*) E1 γ_0***1389.5*** *2* ($\dagger_\gamma$8.4 *8*)

1399.2 *3*, $(5/2,7/2)^+$ γ_{1069}***329.7*** *10* ($\dagger_\gamma$18 *9*) γ_{995}***404.0*** *10* ($\dagger_\gamma$19 *19*) γ_{229}***1170.1*** *4* ($\dagger_\gamma$59 *5*) γ_0***1399.2*** *2* ($\dagger_\gamma$100 *6*)

1414.6 *5*, $13/2^-$ γ_{625}***789.3*** *5* ($\dagger_\gamma$100) M1+E2

1421.3 *5*, $13/2^+$ γ_{1289}***132.1*** *5* γ_{1244}***177.1*** γ_{1034}***387.5*** *5* M1+E3 γ_{776}***644.8*** *5* E2 γ_{625}***796.1***

1465.5, $9/2^-$ γ_{229}***1236.1*** ($\dagger_\gamma$100) E1

1474.6 *5* (?) γ_{229}***1245.3*** *3* ($\dagger_\gamma$84 *7*) γ_0***1474.7*** *3* ($\dagger_\gamma$100 *11*)

1554.3 *1*, $9/2^-$ γ_{1390}***164.6*** *1* ($\dagger_\gamma$<0.36) M1+E2 γ_{1244}***309.96*** *10* ($\dagger_\gamma$20.9 *9*) M1 γ_{1236}***318.60*** *10* ($\dagger_\gamma$10.8 *4*) M1(+E2) γ_{1213}***341.8*** *5* ($\dagger_\gamma$0.85 *8*) γ_{1123}***431.5*** *5* ($\dagger_\gamma$0.8 *4*) γ_{1069}***484.9*** *1* ($\dagger_\gamma$15.0 *7*) M1 γ_{995}***559.07*** *10* ($\dagger_\gamma$32.0 *11*) M1 γ_{778}***775.9*** *3* ($\dagger_\gamma$5.5 *7*) γ_{625}***929.01*** *7* ($\dagger_\gamma$100 *4*) M1+E2: δ=0.62 *18* γ_{229}***1325.1*** *1* ($\dagger_\gamma$4.3 *3*) E1+M2: δ=0.20 *5* γ_0***1554*** ($\dagger_\gamma$<0.05)

1565.2 *2*, $(5/2,7/2)^+$ γ_{1069}***496.2*** *10* ($\dagger_\gamma$6 *3*) γ_{996}***569.6*** *6* ($\dagger_\gamma$<16.7) γ_{828}***737.7*** *10* (?) γ_{776}***788.65*** *15* ($\dagger_\gamma$100 *8*) M1,E2 γ_{755}***810.27*** *20* ($\dagger_\gamma$64 *6*) E2(+M1): δ>0.79 γ_{229}***1336.2*** *5* ($\dagger_\gamma$5.8 *6*) γ_0***1565.2*** *2* ($\dagger_\gamma$<47)

1646.9, $(15/2)^+$ γ_{1421}***225.6*** ($\dagger_\gamma$100) γ_{1034}***613.2*** E2

1696.2 *3*, $5/2^+$ γ_{1399}***297.4*** *2* ($\dagger_\gamma$97 *17*) E2 γ_{1236}***460.6*** *5* ($\dagger_\gamma$37 *20*) γ_{1123}***573.0*** *8* ($\dagger_\gamma$43 *14*) M1,E2 γ_{995}***701.3*** *2* ($\dagger_\gamma$100 *11*) M1,E2 γ_{862}***834.7*** *3* ($\dagger_\gamma$35 *4*) γ_{229}***1466.0*** *4* ($\dagger_\gamma$8.3 *14*)

1756.6, $(15/2)$ γ_{1421}***335.3*** ($\dagger_\gamma$100) (D)

1773.8 *3* γ_{1236}***538.0*** *10* ($\dagger_\gamma$8 *2*) γ_{1069}***704.5*** *2* ($\dagger_\gamma$<80) γ_{778}***995.58*** *20* ($\dagger_\gamma$100 *6*) γ_{229}***1545.0*** *10* ($\dagger_\gamma$1.4 *5*)

1795.7 *3*, $(5/2)^-$ γ_{778}***1017.9*** *4* ($\dagger_\gamma$14 *3*) γ_{755}***1040.4*** *4* ($\dagger_\gamma$49 *5*) (E1) γ_{229}***1565.9*** *1* ($\dagger_\gamma$<48) γ_0***1795.94*** *20* ($\dagger_\gamma$100 *5*) (E1)

1807.3 *3* γ_{1696}***111.17*** *5* ($\dagger_\gamma$100 *28*)

M1+E2: $\delta\approx0.4$ γ_{1399} **407.0** *10* ($\dagger_\gamma$10 *10*) γ_{1390} **418.3** *10* ($\dagger_\gamma$10 *10*) γ_{1069} **737.0** *4* ($\dagger_\gamma$17 *7*) γ_0 **1806.7** *3* ($\dagger_\gamma$14.1 *14*)

1816.3 *3*, (7/2)$^+$ γ_{1399} **416.0** *10* ($\dagger_\gamma$6 *6*) γ_{1236} **580.7** *6* ($\dagger_\gamma$9 *4*) γ_{1123} **693.2** *3* ($\dagger_\gamma$46 *4*) M1 γ_{755} **1061.2** *4* ($\dagger_\gamma$28 *6*) γ_{229} **1586.88** *15* ($\dagger_\gamma$100 *6*) M1+E2 γ_0 **1816.5** *3* ($\dagger_\gamma$25.9 *15*) (E2)

1828 (?) γ_{995} **833** (?) ($\dagger_\gamma$100)

1832.7, (17/2)$^+$ γ_{1421} **411.4** ($\dagger_\gamma$100) E2

1858.2 *8* (?) γ_{229} **1628.9** *5* ($\dagger_\gamma$100 *19*) γ_0 **1858.1** *4* ($\dagger_\gamma$38 *19*)

1905.7 *2*, (7/2$^+$) γ_{1399} **506.0** *10* ($\dagger_\gamma$4 *3*) γ_{1123} **782.6** *2* ($\dagger_\gamma$100 *3*) E2+M1: δ=2 γ_{996} **910.4** *2* ($\dagger_\gamma$47 *3*) M1,E2 γ_{862} **1044.2** *5* ($\dagger_\gamma$11 *2*) γ_{755} **1151** *1* ($\dagger_\gamma$4.7 *3*) γ_{229} **1676.5** *2* ($\dagger_\gamma$21.7 *11*) M1+E2 γ_0 **1905.6** *4* ($\dagger_\gamma$1.0 *4*)

1910.1 *4*, 5/2,7/2 γ_{1069} **840.8** *3* ($\dagger_\gamma$100 *50*) γ_{862} **1048.6** *6* ($\dagger_\gamma$83 *25*) γ_{755} **1154.7** *10* ($\dagger_\gamma$38 *38*) γ_{229} **1680.9** *4* ($\dagger_\gamma$78 *5*) γ_0 **1910.0** *3* ($\dagger_\gamma$46 *5*)

A **1926.7** *6*, 19/2$^-$ γ_{1347} **580.2** ($\dagger_\gamma$100) E2

1950.6 *2*, (5/2,7/2)$^-$ γ_{1236} **714.57** *15* ($\dagger_\gamma$62 *4*) M1 γ_{1213} **737.0** *4* (?) γ_{1123} **827.8** *1* ($\dagger_\gamma$100 *16*) γ_{1069} **882.3** *5* ($\dagger_\gamma$12 *4*) γ_{229} **1721.3** *5* ($\dagger_\gamma$2.00 *6*) γ_0 **1950.7** *2* ($\dagger_\gamma$13.2 *16*)

1961.3 *5* (?) γ_{776} **1184.7** *3* ($\dagger_\gamma$78.5 *63*) γ_{229} **≈1731** (?) ($\dagger_\gamma$9 *9*) γ_0 **1961.5** *4* ($\dagger_\gamma$100 *9*)

1986.9 *5* γ_{1554} **433.0** *5* ($\dagger_\gamma$73 *55*) γ_{1069} **917.0** *5* ($\dagger_\gamma$45 *18*) γ_{862} **1125.5** *5* ($\dagger_\gamma$100 *55*) γ_{778} **1209.4** *5* ($\dagger_\gamma$30 *4*) γ_{229} **1757.6** *3* ($\dagger_\gamma$25 *3*) γ_0 **1986.7** *3* ($\dagger_\gamma$58 *5*)

1995.6 *4*, (7/2,9/2)$^-$ γ_{1244} **750.8** *8* ($\dagger_\gamma$100 *33*) (M1) γ_{776} **1219.4** *4* ($\dagger_\gamma$30 *3*) γ_{625} **1370.5** *3* ($\dagger_\gamma$50 *5*) E2 γ_{229} **1765.9** *4* ($\dagger_\gamma$27 *3*)

2001.7 (?) γ_{1647} **354.8** (?) ($\dagger_\gamma$100)

2014.1 *7*, (17/2)$^-$ γ_{1347} **667.5** ($\dagger_\gamma$100) (M1)

2165.2 *5* γ_{1360} **804.54** *20* ($\dagger_\gamma$100 *8*) E2(+M1): δ>0.64 γ_{1069} **1096.4** *4* ($\dagger_\gamma$13 *13*) γ_{776} **1389.5** *2* (?) ($\dagger_\gamma$23 *3*) γ_{229} **1937.2** *2* ($\dagger_\gamma$1.5 *5*)

A **2293.2**, 23/2$^-$ γ_{1927} **366.3** ($\dagger_\gamma$100) E2

2348.0, 21/2$^-$ γ_{2293} **55** γ_{1927} **421.1** ($\dagger_\gamma$100 *3*) M1+E2: δ=+0.22$^{+6}_{-11}$

2845.3, (19/2,23/2)$^-$ γ_{2348} **497.3** ($\dagger_\gamma$100) M1+E2

A **2900.9**, 27/2$^-$ γ_{2293} **607.7** ($\dagger_\gamma$100) E2

2996.9, 23/2$^-$ γ_{2348} **648.9** ($\dagger_\gamma$24.3 *4*) M1+E2: δ=+2.5$^{+10}_{-6}$ γ_{2293} **704.4** ($\dagger_\gamma$100 *1*) M1+E2: δ=+0.38 *4*

3191.2, (25/2$^+$,29/2$^+$) γ_{2901} **290.3** ($\dagger_\gamma$100) E1

3230.1, (27/2)$^-$ γ_{2997} **233** γ_{2901} **329.8** ($\dagger_\gamma$100 *2*) M1+E2: δ=−0.52 *13*

3523.6, (29/2)$^+$ γ_{3230} **293.5** ($\dagger_\gamma$96 *3*) E1 γ_{2901} **622.7** ($\dagger_\gamma$100 *2*) E1

3795.2, (31/2$^-$) γ_{3524} **271.6** ($\dagger_\gamma$100) E1

4178.1, (33/2$^+$) γ_{3795} **382.9** ($\dagger_\gamma$100) E1

B **x**, J

B **790+x** *1*, J+2 γ_x **790** *1* $I^{(2)}$=74.1, $\hbar\omega$=0.409

B **1634+x** *1*, J+4 γ_{790+x} **844** *1* $I^{(2)}$=82.5, $\hbar\omega$=0.434

B **2526.5+x** *10*, J+6 γ_{1634+x} **892.5** *10* $I^{(2)}$=73.4, $\hbar\omega$=0.460

B **3473.5+x** *17*, J+8 γ_{2527+x} **947** *1* $I^{(2)}$=72.7, $\hbar\omega$=0.487

B **4476+x** *2*, J+10 γ_{3474+x} **1002** *1* $I^{(2)}$=73.4, $\hbar\omega$=0.515

B **5532+x** *2*, J+12 γ_{4476+x} **1056.5** *10* $I^{(2)}$=70.8, $\hbar\omega$=0.542

B **6645+x** *3*, J+14 γ_{5532+x} **1113** *1* $I^{(2)}$=71.4, $\hbar\omega$=0.570

B **7814+x** *3*, J+16 γ_{6645+x} **1169** *1* $I^{(2)}$=69.6, $\hbar\omega$=0.599

B **9041+x** *3*, J+18 γ_{7814+x} **1226.5** *10* $I^{(2)}$=69.0, $\hbar\omega$=0.628

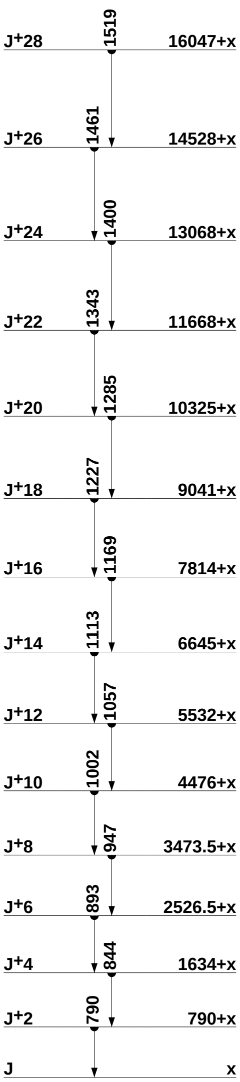
B **10325+x** *3*, J+20 γ_{9041+x} **1284.5** *10* $I^{(2)}$=69.0, $\hbar\omega$=0.657

B **11668+x** *3*, J+22 $\gamma_{10325+x}$ **1342.5** *10* $I^{(2)}$=69.6, $\hbar\omega$=0.686

B **13068+x** *4*, J+24 $\gamma_{11668+x}$ **1400** *1* $I^{(2)}$=66.1, $\hbar\omega$=0.715

B **14528+x** *4*, J+26 $\gamma_{13068+x}$ **1460.5** *10* $I^{(2)}$=69.0, $\hbar\omega$=0.745

B **16047+x** *4*, J+28 $\gamma_{14528+x}$ **1518.5** *10*



SD band
(97HaAA)

$^{147}_{63}Eu$