## $^{124}$Sn($^{37}$Cl,6nγ) 2015Re03

| Type | Author | History Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | N. Nica | NDS 160, 1 (2019) | 21-Oct-2019 |

Data set based on XUNDL file compiled by J. Chen (NSCL, MSU) and B. Singh (McMaster).

Before this evaluation the data coming from several heavy ion reactions populating the high spin region in $^{155}$Ho were presented in the (HI,xnγ) dataset, coming from six papers published in between 1978 and 1997. Following a gap the 2015Re03 paper – the most extensive source of data in this respect – is presented here in α separate dataset in order to allow a better exposure of the progress made in the high spin region. Typically the upper part of the level scheme (above about 8000 keV) is entirely newly added, as well as many details of the existing level scheme, including band 1 (almost all newly added too).

2015Re03, 2015Pa16: E=180 MeV $^{37}$Cl beam was produced from the ATLAS accelerator of the Argonne National Laboratory. Target was two thin stacked self-supporting foils of $^{124}$Sn of total thickness 1.1 mg/cm$^2$. γ rays were detected with the Gammasphere spectrometer of 101 Compton-suppressed HPGe detectors. Measured Eγ, Iγ, γγ-coin, γγγγ-coin, γγ(θ). Deduced levels, J, π, bands, configurations, γ-ray multipolarities. Comparison with cranked Nilsson-Strutinsky calculations.

### $^{155}$Ho Levels

Band 3 decays by E2 transitions to band 1, whence for band 3 π=+.
Band 5 decays by E2 transitions to band 3, whence for band 5 π=+.
Quasiparticle labeling scheme:
A: $\nu i_{13/2}$, α=+1/2.
B: $\nu i_{13/2}$, α=−1/2.
E: $\nu(f_{7/2}/h_{9/2})$, α=+1/2.
F: $\nu(f_{7/2}/h_{9/2})$, α=−1/2.
$A_p$: $\pi h_{11/2}$, α=−1/2$^{-1}$.
$B_p$: $\pi h_{11/2}$, α=+1/2$^{-1}$.
$C_p$: $\pi h_{11/2}$, α=−1/2$^{-2}$.
$D_p$: $\pi h_{11/2}$, α=+1/2$^{-2}$.
$E_p$: $N_{osc}$=4, α=−1/2.
$F_p$: $N_{osc}$=4, α=+1/2.
B(M1)/B(E2)=(1/1.43)[Iγ(M1)/Iγ(E2)][Eγ(ΔJ=2)$^5$/Eγ(ΔJ=1)$^3$], where Eγ is in MeV. The ΔJ=1 transitions were assumed to be pure dipole. Branching ratio Iγ(ΔJ=1)/Iγ(ΔJ=2) were determined separately from coincidence spectra with gates on relevant transitions.

| E(level)[†] | J$^{\pi}$[‡] | T$_{1/2}$[#] | Comments |
|---|---|---|---|
| 0.0[@] | 5/2+[#] | | |
| 110.11[&] *24* | 7/2+[#] | | |
| 141.8[b] *3* | 11/2−[#] | 0.88 ms *8* | %IT=100 |
| 230.4[a] *4* | 9/2− | | |
| 344.09[@] *24* | 9/2+ | | B(M1)/B(E2)=0.71 *8*. |
| 518.5[b] *4* | 15/2− | | |
| 538.0[a] *4* | 13/2− | | B(M1)/B(E2)=0.20 *4*. |
| 564.8[&] *3* | 11/2+ | | B(M1)/B(E2)=0.56 *7*. |
| 816.9[@] *3* | 13/2+ | | B(M1)/B(E2)=0.28 *3*. |
| 1001.4[a] *4* | 17/2− | | B(M1)/B(E2)=0.116 *9*. |
| 1017.2[b] *4* | 19/2− | | |
| 1079.9[&] *4* | 15/2+ | | B(M1)/B(E2)=0.35 *7*. |
| 1361.6[@] *4* | 17/2+ | | B(M1)/B(E2)=0.57 *10*. |
| 1561.0[a] *4* | 21/2− | | B(M1)/B(E2)=0.142 *18*. |
| 1605.0[b] *4* | 23/2− | | |

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## $^{124}$Sn($^{37}$Cl,6n$\gamma$) **2015Re03** (continued)

### $^{155}$Ho Levels (continued)

| E(level)[†] | J$^{\pi}$[‡] | Comments |
|---|---|---|
| 1646.7 *4* | 19/2$^+$ | |
| 1669.2[&] *4* | 19/2$^+$ | B(M1)/B(E2)=0.49 *5*. |
| 1972.7[@] *5* | 21/2$^+$ | |
| 2129.1[d] *4* | 23/2$^+$ | |
| 2189.0[a] *4* | 25/2$^-$ | B(M1)/B(E2)=0.109 *16*. |
| 2265.2[b] *4* | 27/2$^-$ | B(M1)/B(E2)=0.76 *7*. |
| 2296.9[&] *5* | 23/2$^+$ | |
| 2464.2[d] *4* | 27/2$^+$ | |
| 2616.5[@] *6* | 25/2$^+$ | |
| 2643.6[e] *4* | 27/2$^+$ | |
| 2729.7[c] *4* | 29/2$^+$ | |
| 2858.6[a] *5* | 29/2$^-$ | B(M1)/B(E2)=0.162 *18*. |
| 2876.6 *5* | (29/2$^+$) | level pertaining possibly to the signature partner of band 4. |
| 2917.1[d] *4* | 31/2$^+$ | B(M1)/B(E2)=0.224 *19*. |
| 2935.3[&] *6* | (27/2$^+$) | |
| 2977.8[b] *5* | 31/2$^-$ | B(M1)/B(E2)=1.14 *8*. |
| 3064.5[e] *4* | 31/2$^+$ | |
| 3262.4[c] *5* | 33/2$^+$ | |
| 3264.6[@] *7* | 29/2$^+$ | |
| 3399.4[a] *5* | 33/2$^-$ | B(M1)/B(E2)=0.56 *9*. |
| 3489.4[d] *5* | 35/2$^+$ | B(M1)/B(E2)=0.146 *19*. |
| 3651.0[b] *5* | 35/2$^-$ | B(M1)/B(E2)=1.45 *17*. |
| 3657.3[e] *5* | 35/2$^+$ | |
| 3834.2?[@] *12* | (33/2$^+$) | |
| 3838.2[c] *5* | 37/2$^+$ | B(M1)/B(E2)=4.9 *9*. |
| 3905.7[a] *5* | 37/2$^-$ | |
| 4120.1[d] *5* | 39/2$^+$ | B(M1)/B(E2)=0.274 *24*. |
| 4211.0[b] *5* | 39/2$^-$ | B(M1)/B(E2)=0.88 *9*. 2015Re03 list values for 37/2$^-$ band member, but the gamma-ray energies listed correspond to those from 39/2$^-$ level. |
| 4278.1[e] *5* | 39/2$^+$ | |
| 4489.1[c] *5* | 41/2$^+$ | B(M1)/B(E2)=2.7 *3*. |
| 4493.6[a] *5* | 41/2$^-$ | |
| 4601.2 *5* | 41/2$^+$ | |
| 4837.7[b] *5* | 43/2$^-$ | |
| 4875.3[d] *5* | 43/2$^+$ | B(M1)/B(E2)=0.308 *22*. |
| 5135.5 *5* | (41/2$^+$) | |
| 5167.1[a] *6* | 45/2$^-$ | |
| 5214.4[c] *5* | 45/2$^+$ | B(M1)/B(E2)=5.1 *6*. |
| 5392.0[f] *5* | 45/2$^+$ | |
| 5546.6[b] *6* | 47/2$^-$ | B(M1)/B(E2)=1.28 *9*. |
| 5710.0[d] *5* | 47/2$^+$ | |
| 5786.3 *6* | (45/2$^+$) | |
| 5932.4[a] *6* | 49/2$^-$ | B(M1)/B(E2)=0.90 *9*. |
| 6057.3[c] *5* | 49/2$^+$ | B(M1)/B(E2)=2.6 *3*. |
| 6167.9[f] *5* | 49/2$^+$ | |
| 6341.5[b] *6* | 51/2$^-$ | B(M1)/B(E2)=0.80 *16*. |
| 6575.8[i] *7* | (51/2$^-$) | No $\gamma$ transitions shown from this level in Fig. 1. |
| 6616.9[d] *6* | 51/2$^+$ | |

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**$^{124}Sn(^{37}Cl,6n\gamma)$ 2015Re03 (continued)**

$^{155}$Ho Levels (continued)

| E(level)† | Jπ‡ | Comments |
|---|---|---|
| 6773.7[a] *6* | 53/2− | B(M1)/B(E2)=0.87 *9*. |
| 6843.2[f] *5* | 53/2+ | |
| 6952.4[c] *6* | 53/2+ | |
| 7194.3[b] *6* | 55/2− | B(M1)/B(E2)=2.3 *7*. |
| 7291.9[f] *6* | 57/2+ | |
| 7420.8[i] *6* | (55/2−) | |
| 7535.4[d] *6* | 55/2+ | |
| 7679.9[a] *6* | 57/2− | B(M1)/B(E2)=0.97 *9*. |
| 7711.0 *6* | 57/2− | |
| 7820.0[c] *6* | 57/2+ | |
| 8053.7[b] *6* | 59/2− | |
| 8221.9[f] *6* | 61/2+ | |
| 8240.7 *6* | 59/2− | |
| 8273.3[i] *6* | (59/2−) | |
| 8387.1[h] *6* | 61/2+ | |
| 8486.4 *6* | 61/2− | |
| 8515.3[a] *6* | 61/2− | B(M1)/B(E2)=0.95 *21*. |
| 8741.8[i] *6* | 63/2− | |
| 8905.3 *6* | 65/2− | Non-collective oblate state with configuration=$\pi h^3_{11/2}\ _{27/2-} \otimes \nu[(i^2_{13/2}\ _{12})(f_{7/2}/h^4_{9/2}\ _{7}]_{19+}$. |
| 8924.3[b] *6* | 63/2− | B(M1)/B(E2)=3.5 *3*. |
| 9086.7[f] *6* | 65/2+ | |
| 9279.2[h] *6* | 65/2+ | |
| 9430.3 *6* | 65/2+ | |
| 9543.5[i] *6* | 67/2− | |
| 9617.5[a] *6* | 65/2− | |
| 9649.1[j] *7* | (67/2−) | E(level): depend on the order of 744γ and 1086γ that according to 2015Re03 is ambigous. |
| 9667.7[g] *7* | 67/2+ | |
| 9958.1[b] *6* | 67/2− | |
| 10177.4[h] *6* | 69/2+ | |
| 10290.0[g] *7* | 71/2+ | |
| 10422.5[i] *7* | 71/2− | |
| 10519.6[a] *7* | 69/2− | |
| 10735.3[j] *7* | (71/2−) | |
| 10858.2[b] *7* | (71/2−) | |
| 11035.9[i] *7* | 75/2− | |
| 11159.7[h] *7* | (73/2+) | |
| 11323.4[j] *7* | (75/2−) | |
| 11330.4[a] *8* | (73/2−) | |
| 11674.2[i] *7* | 79/2− | Non-collective oblate state with configuration=$\pi h^3_{11/2}\ _{27/2-} \otimes \nu[(i^2_{13/2}\ _{12})(f_{7/2}/h^4_{9/2}\ _{14}]_{26+}$. |
| 11810.4?[j] *12* | (77/2−) | |
| 12195.5[l] *8* | 77/2+ | |
| 12454.0[l] *8* | (81/2+) | |
| 12596.9[k] *8* | 81/2 | |
| 13139.0[l] *8* | (85/2+) | |
| 13489.5[k] *8* | 85/2 | |
| 13556.8 *8* | 83/2− | |
| 13600.8 *8* | 83/2− | |
| 13759.0[k] *8* | (87/2) | Non-collective oblate state with configuration= $\pi[(d_{5/2}/g^{-1}_{7/2}\ _{3/2})(h^4_{11/2}\ _{16})]_{35/2+} \otimes \nu[(i^2_{13/2}\ _{12})(f_{7/2}/h^4_{9/2}\ _{14}]_{26+}$. |

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## $^{124}Sn(^{37}Cl,6n\gamma)$ 2015Re03 (continued)

### $^{155}Ho$ Levels (continued)

| E(level)[†] | $J^{\pi}$[‡] | Comments |
|---|---|---|
| 13989.5 *8* | 85/2 | |
| 14195.3 *8* | 85/2⁻ | |
| 14202.5[l] *8* | (89/2⁺) | Non-collective oblate state with configuration= $\pi[(d_{5/2}/g^{-1}_{7/2}\ _{5/2})(h^4_{11/2}\ _{16})]_{37/2+}\otimes \nu[(i^2_{13/2}\ _{12})(f_{7/2}/h^4_{9/2}\ _{14}]_{26+}$. |
| 14554.2 *8* | 87/2⁻ | Non-collective oblate state with configuration= $\pi[(d_{5/2}/g^{-1}_{7/2}\ _{5/2})(h^3_{11/2}\ _{27/2})(d_{3/2}\ _{3/2})]_{35/2-}\otimes\nu[(i^2_{13/2}\ _{12})(f_{7/2}/h^4_{9/2}\ _{14}]_{26+}$. |
| 14699.7 *8* | 87/2⁻ | |
| 14888.3 *13* | (87/2⁻) | |

† From a least-squares fit (by compilers) to γ-ray energies.
‡ As given in 2015Re03 based on deduced γ-ray multipolarities and band structures, unless otherwise noted.
\# From Adopted Levels, Gammas dataset.
@ Band(A): Band 1, π5/2[402],α=+1/2 or $F_p$. Based on $\pi d_{5/2}$ orbital.
& Band(a): Band 1, π5/2[402],α=−1/2 or $E_p$. Based on $\pi d_{5/2}$ orbital.
a Band(B): Band 2, π7/2[523],α=+1/2. Based on $\pi h_{11/2}$ orbital. Configuration: $B_p$ ->$B_pAB$ ->$A_pB_pD_pAB$.
b Band(b): Band 2, π7/2[523],α=−1/2. Based on $\pi h_{11/2}$ orbital. Configuration: $A_p$ ->$A_pAB$ ->$A_pB_pC_pAB$.
c Band(C): Band 3, based on 29/2⁺,α=+1/2. Configuration=$\pi h_{11/2}\otimes\nu(i_{13/2}f_{7/2}h_{9/2})$ or $A_pAE$.
d Band(c): Band 3, based on 23/2⁺,α=−1/2. Configuration=$\pi h_{11/2}\otimes\nu(i_{13/2}f_{7/2}h_{9/2})$ or $B_pAE$.
e Band(D): Band 4, based on 27/2⁺ Configuration=$\pi h_{11/2}\otimes\nu(i_{13/2}f_{7/2}h_{9/2})$ or $A_pAF$.
f Band(E): Band 5, based on 45/2⁺ Irregular band.
g Band(F): Band 5a, based on 67/2⁺.
h Band(G): Band 5b, based on 61/2⁺.
i Band(H): Band 6, based on (59/2⁻).
j Band(I): Band 6a, based on (67/2⁻).
k Band(J): Band 7a, based on 81/2.
l Band(K): Band 7b, based on 77/2⁺.

### $\gamma(^{155}Ho)$

Angular-intensity ratio is defined by R=$I_{\gamma\gamma}[\theta\approx30°(150°)]/I_{\gamma\gamma}[\theta\approx90°]$, with typical values of R≈0.6 for a pure stretched dipole (ΔJ=1) transition and R≈1.1 for a stretched quadrupole (ΔJ=2) transition (2015Re03).

| $E_\gamma$[†] | $I_\gamma$[‡] | $E_i$(level) | $J^\pi_i$ | $E_f$ | $J^\pi_f$ | Mult.[#] | Comments |
|---|---|---|---|---|---|---|---|
| 31.7 *1* | | 141.8 | 11/2⁻ | 110.11 | 7/2⁺ | M2 | $E_\gamma$,Mult.: from Adopted Levels, Gammas dataset. |
| 75.7 | <1 | 2265.2 | 27/2⁻ | 2189.0 | 25/2⁻ | | $I_\gamma$: Iγ(76,M1)/Iγ(660,E2)=0.0067 *6*. |
| 88.6 *3* | 1.8 *2* | 230.4 | 9/2⁻ | 141.8 | 11/2⁻ | | |
| 110.1 *3* | 9.9 *10* | 110.11 | 7/2⁺ | 0.0 | 5/2⁺ | D | R=0.53 *7*. |
| 119.0 *3* | 3.20 *32* | 2977.8 | 31/2⁻ | 2858.6 | 29/2⁻ | | $I_\gamma$: Iγ(119,M1)/Iγ(713,E2)=0.0149 *11*. |
| 163.4 *3* | 13.8 *7* | 8905.3 | 65/2⁻ | 8741.8 | 63/2⁻ | D | R=0.577 *25*. |
| 187.4 *3* | 11.6 *6* | 2917.1 | 31/2⁺ | 2729.7 | 29/2⁺ | D | $I_\gamma$: Iγ(187,M1)/Iγ(453,E2)=0.110 *9*. R=0.64 *5*. |
| 187.9 *3* | 1.18 *12* | 3064.5 | 31/2⁺ | 2876.6 | (29/2⁺) | | |
| 213.0 *3* | 2.2 *2* | 8486.4 | 61/2⁻ | 8273.3 | (59/2⁻) | D(+Q) | R=0.66 *22*. |
| 220.7 | <1 | 564.8 | 11/2⁺ | 344.09 | 9/2⁺ | | $I_\gamma$: Iγ(221,M1)/Iγ(455,E2)=0.45 *6*. |
| 226.3 *3* | 2.47 *25* | 6843.2 | 53/2⁺ | 6616.9 | 51/2⁺ | | |
| 226.6 *3* | 5.61 *56* | 8741.8 | 63/2⁻ | 8515.3 | 61/2⁻ | D(+Q) | R=0.540 *21*. |
| 227.0 *3* | 5.3 *5* | 3489.4 | 35/2⁺ | 3262.4 | 33/2⁺ | D | $I_\gamma$: Iγ(227,M1)/Iγ(572,E2)=0.040 *5*. R=0.61 *5*. |

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**$^{124}$Sn($^{37}$Cl,6nγ) 2015Re03 (continued)**

γ($^{155}$Ho) (continued)

| Eγ[†] | Iγ[‡] | Ei(level) | $J^\pi_i$ | Ef | $J^\pi_f$ | Mult.[#] | Comments |
|---|---|---|---|---|---|---|---|
| 233.0 *3* | 2.7 *3* | 2876.6 | (29/2+) | 2643.6 | 27/2+ | | |
| 234.0 *3* | 2.4 *2* | 344.09 | 9/2+ | 110.11 | 7/2+ | (M1+E2) | R=0.82 *9*.<br>Iγ: Iγ(234,M1)/Iγ(344,E2)=2.1 *3*. |
| 244.8 *3* | 18.1 *9* | 8486.4 | 61/2− | 8240.7 | 59/2− | D(+Q) | Eγ: poor fit, level-energy difference=245.7.<br>R=0.68 *4*. |
| 251.7 *3* | 8.6 *9* | 3651.0 | 35/2− | 3399.4 | 33/2− | D | Iγ: Iγ(252,M1)/Iγ(673,E2)=0.24 *3*.<br>R=0.58 *3*. |
| 252.1 *3* | 1.1 *1* | 816.9 | 13/2+ | 564.8 | 11/2+ | (M1+E2) | Iγ: Iγ(252,M1)/Iγ(473,E2)=0.27 *3*.<br>R=0.94 *11*. |
| 254.7 *3* | 20.0 *10* | 3905.7 | 37/2− | 3651.0 | 35/2− | D | R=0.585 *16*. |
| 255.4 *3* | 7.4 *7* | 8741.8 | 63/2− | 8486.4 | 61/2− | D(+Q) | R=0.686 *19*. |
| 256.5 *3* | 6.1 *6* | 5392.0 | 45/2+ | 5135.5 | (41/2+) | | |
| 258.7 | <1 | 12454.0 | (81/2+) | 12195.5 | 77/2+ | | |
| 263.1 *3* | 1.5 *2* | 1079.9 | 15/2+ | 816.9 | 13/2+ | | Iγ: Iγ(263,M1)/Iγ(515,E2)=0.25 *5*. |
| 265.5 *3* | 25.4 *13* | 2729.7 | 29/2+ | 2464.2 | 27/2+ | D(+Q) | R=0.62 *22*. |
| 269.6 *3* | 2.0 *2* | 13759.0 | (87/2) | 13489.5 | 85/2 | (D+Q) | R=0.91 *23*. |
| 273.6 *3* | 16.5 *8* | 2917.1 | 31/2+ | 2643.6 | 27/2+ | | |
| 274.1 *3* | 3.1 *3* | 4875.3 | 43/2+ | 4601.2 | 41/2+ | | |
| 275.3 *3* | 24.9 *12* | 2464.2 | 27/2+ | 2189.0 | 25/2− | D | Mult.: E1 was adopted by 2015Re03 based on Δπ=yes interband D transition;<br>R=0.72 *5*. |
| 281.5 | <1 | 1361.6 | 17/2+ | 1079.9 | 15/2+ | | Iγ: Iγ(282,M1)/Iγ(545,E2)=0.38 *7*. |
| 281.9 *3* | 5.3 *5* | 4120.1 | 39/2+ | 3838.2 | 37/2+ | D(+Q) | Iγ: Iγ(282,M1)/Iγ(631,E2)=0.086 *8*.<br>R=0.79 *9*. |
| 282.6 *3* | 12.9 *6* | 4493.6 | 41/2− | 4211.0 | 39/2− | D | R=0.63 *3*. |
| 285.3 *3* | 1.5 *2* | 1646.7 | 19/2+ | 1361.6 | 17/2+ | | |
| 305.3 *3* | 13.6 *7* | 4211.0 | 39/2− | 3905.7 | 37/2− | D(+Q) | Iγ: Iγ(305,M1)/Iγ(560,E2)=0.65 *6*.<br>R=0.70 *4*. |
| 307.3 *3* | 1.5 *2* | 1669.2 | 19/2+ | 1361.6 | 17/2+ | | Iγ: Iγ(307,M1)/Iγ(589,E2)=0.29 *3*. |
| 307.6 *3* | 8.8 *9* | 538.0 | 13/2− | 230.4 | 9/2− | E2 | R=1.00 *8*. |
| 323.4 *3* | 6.9 *7* | 4601.2 | 41/2+ | 4278.1 | 39/2+ | D | R=0.55 *9*. |
| 329.4 *3* | 9.1 *9* | 5167.1 | 45/2− | 4837.7 | 43/2− | D | R=0.57 *6*. |
| 334.8 *3* | 6.0 *6* | 3064.5 | 31/2+ | 2729.7 | 29/2+ | (M1+E2) | R=0.78 *10*. |
| 335.0 *3* | 33.2 *17* | 2464.2 | 27/2+ | 2129.1 | 23/2+ | E2 | R=1.12 *9*. |
| 335.6 *3* | 2.7 *3* | 6952.4 | 53/2+ | 6616.9 | 51/2+ | | |
| 339.0 *3* | 22.7 *11* | 5214.4 | 45/2+ | 4875.3 | 43/2+ | D(+Q) | Iγ: Iγ(339,M1)/Iγ(725,E2)=1.42 *16*.<br>R=0.70 *9*. |
| 340.6 *3* | 8.3 *8* | 9958.1 | 67/2− | 9617.5 | 65/2− | | |
| 344.1[@] *3* | 1.2[@] *1* | 344.09 | 9/2+ | 0.0 | 5/2+ | | |
| 344.1[@] *3* | 12.2[@] *6* | 4837.7 | 43/2− | 4493.6 | 41/2− | D(+Q) | R=0.66 *3*. |
| 345.2 *3* | 10.7 *5* | 3262.4 | 33/2+ | 2917.1 | 31/2+ | D | R=0.66 *4*. |
| 347.4 *3* | 9.4 *9* | 6057.3 | 49/2+ | 5710.0 | 47/2+ | D(+Q) | Iγ: Iγ(347,M1)/Iγ(843,E2)=0.37 *4*.<br>R=0.71 *9*. |
| 348.8 *3* | 13.2 *7* | 3838.2 | 37/2+ | 3489.4 | 35/2+ | D | Iγ: Iγ(349,M1)/Iγ(576,E2)=4.6 *8*.<br>R=0.668 *23*. |
| 350.7 *3* | 4.6 *5* | 11674.2 | 79/2− | 11323.4 | (75/2−) | | |
| 354.9 *3* | 3.28 *33* | 8741.8 | 63/2− | 8387.1 | 61/2+ | D | R=0.57 *10*. |
| 369.0 *3* | 14.3 *7* | 4489.1 | 41/2+ | 4120.1 | 39/2+ | D | Iγ: Iγ(369,M1)/Iγ(651,E2)=1.64 *16*.<br>R=0.622 *22*. |
| 374.2 *3* | 7.7 *8* | 8053.7 | 59/2− | 7679.9 | 57/2− | | |
| 376.7 *3* | 100 *5* | 518.5 | 15/2− | 141.8 | 11/2− | E2 | R=0.983 *21*. |
| 379.5 *3* | 14.1 *7* | 5546.6 | 47/2− | 5167.1 | 45/2− | | Iγ: Iγ(380,M1)/Iγ(709,E2)=0.56 *9*. |
| 381.6 *3* | 4.7 *5* | 6167.9 | 49/2+ | 5786.3 | (45/2+) | | R=0.73 *9*.<br>Mult.: R value not proper for E2 adopted by 2015Re03. |

Continued on next page (footnotes at end of table)

## $^{124}$Sn($^{37}$Cl,6n$\gamma$) 2015Re03 (continued)

### $\gamma$($^{155}$Ho) (continued)

| $E_\gamma$† | $I_\gamma$‡ | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult.# | Comments |
|---|---|---|---|---|---|---|---|
| 385.8 3 | 6.5 7 | 5932.4 | 49/2− | 5546.6 | 47/2− | | $I_\gamma$: Iγ(386,M1)/Iγ(765,E2)=0.28 3. |
| 386.3 3 | 7.1 7 | 4875.3 | 43/2+ | 4489.1 | 41/2+ | D(+Q) | $I_\gamma$: Iγ(386,M1)/Iγ(755,E2)=0.103 7. R=0.75 11. |
| 388.7 3 | 0.7 1 | 13989.5 | 85/2 | 13600.8 | 83/2− | D(+Q) | R=0.70 10. |
| 395.0 3 | 8.3 8 | 3657.3 | 35/2+ | 3262.4 | 33/2+ | (M1+E2) | R=1.04 9. Mult.,δ: R value does not exclude E2. |
| 396.2 3 | 23 1 | 538.0 | 13/2− | 141.8 | 11/2− | (M1+E2) | $I_\gamma$: Iγ(396,M1)/Iγ(308,E2)=6.6 15. R=0.91 3. |
| 401.9 3 | 6.3 6 | 8221.9 | 61/2+ | 7820.0 | 57/2+ | E2 | R=1.14 5. |
| 408.9 3 | 2.7 3 | 8924.3 | 63/2− | 8515.3 | 61/2− | (M1+E2) | $I_\gamma$: Iγ(409,M1)/Iγ(871,E2)=0.69 5. R=0.76 6. |
| 409.0 3 | 4.7 5 | 6341.5 | 51/2− | 5932.4 | 49/2− | | $I_\gamma$: Iγ(409,M1)/Iγ(795,E2)=0.25 5. |
| 418.8 3 | 12.3 6 | 8905.3 | 65/2− | 8486.4 | 61/2− | E2 | R=1.04 17. |
| 420.5 3 | 3.7 4 | 7194.3 | 55/2− | 6773.7 | 53/2− | | $I_\gamma$: Iγ(421,M1)/Iγ(853,E2)=0.69 25. |
| 420.9 3 | 10.9 5 | 3064.5 | 31/2+ | 2643.6 | 27/2+ | E2 | R=1.1 3. |
| 421.5 3 | 10.3 5 | 3399.4 | 33/2− | 2977.8 | 31/2− | | $I_\gamma$: Iγ(421,M1)/Iγ(541,E2)=1.29 22. |
| 432.2 3 | 4.8 5 | 6773.7 | 53/2− | 6341.5 | 51/2− | D(+Q) | $I_\gamma$: Iγ(432,M1)/Iγ(841,E2)=0.238 25. R=0.69 16. |
| 432.8 3 | 0.7 1 | 13989.5 | 85/2 | 13556.8 | 83/2− | (M1+E2) | R=0.80 9. |
| 443.7 3 | 1.2 1 | 14202.5 | (89/2+) | 13759.0 | (87/2) | (M1+E2) | R=0.84 5. |
| 448.7 3 | 28.4 14 | 7291.9 | 57/2+ | 6843.2 | 53/2+ | E2 | R=1.17 3. |
| 453.0 3 | 29.2 15 | 2917.1 | 31/2+ | 2464.2 | 27/2+ | E2 | R=0.932 9. |
| 454.5 3 | 10.6 5 | 2643.6 | 27/2+ | 2189.0 | 25/2− | | |
| 454.7 3 | 1.8 2 | 564.8 | 11/2+ | 110.11 | 7/2+ | E2 | R=1.01 15. |
| 457.9 3 | 6.5 7 | 6167.9 | 49/2+ | 5710.0 | 47/2+ | | |
| 459.8 3 | 4.5 5 | 2129.1 | 23/2+ | 1669.2 | 19/2+ | E2 | R=0.94 8. |
| 461.7 3 | 6.6 7 | 8515.3 | 61/2− | 8053.7 | 59/2− | | $I_\gamma$: Iγ(462,M1)/Iγ(835,E2)=0.33 7. |
| 463.3 3 | 29.3 15 | 1001.4 | 17/2− | 538.0 | 13/2− | E2 | R=0.970 11. |
| 464.5 3 | 6.9 7 | 2729.7 | 29/2+ | 2265.2 | 27/2− | D | R=0.51 10. |
| 468.2 | <1 | 8741.8 | 63/2− | 8273.3 | (59/2−) | | |
| 472.8 3 | 3.0 3 | 816.9 | 13/2+ | 344.09 | 9/2+ | E2 | R=1.02 9. |
| 481.0 3 | 7.2 7 | 4601.2 | 41/2+ | 4120.1 | 39/2+ | | |
| 482.4 3 | 8.9 9 | 2129.1 | 23/2+ | 1646.7 | 19/2+ | E2 | R=1.10 5. |
| 482.8 3 | 19.5 10 | 1001.4 | 17/2− | 518.5 | 15/2− | | $I_\gamma$: Iγ(483,M1)/Iγ(463,E2)=0.88 7. |
| 485.6 3 | 5.9 6 | 7679.9 | 57/2− | 7194.3 | 55/2− | | $I_\gamma$: Iγ(486,M1)/Iγ(906,E2)=0.260 25. |
| 487.0& | <1 | 11810.4? | (77/2−) | 11323.4 | (75/2−) | | |
| 498.6 3 | 100 5 | 1017.2 | 19/2− | 518.5 | 15/2− | E2 | R=1.02 3. |
| 506.2 3 | 18.0 9 | 3905.7 | 37/2− | 3399.4 | 33/2− | E2 | R=1.17 7. |
| 514.5 3 | 21.6 11 | 2643.6 | 27/2+ | 2129.1 | 23/2+ | | |
| 515.2 3 | 6.0 6 | 1079.9 | 15/2+ | 564.8 | 11/2+ | E2 | R=0.82 17. |
| 516.7 3 | 11.1 6 | 5392.0 | 45/2+ | 4875.3 | 43/2+ | D(+Q) | R=0.83 19. |
| 519.8 3 | 5.8 6 | 8741.8 | 63/2− | 8221.9 | 61/2+ | D | R=0.59 12. |
| 524.1 3 | 3.5 4 | 2129.1 | 23/2+ | 1605.0 | 23/2− | | |
| 540.9 3 | 14.5 7 | 3399.4 | 33/2− | 2858.6 | 29/2− | | |
| 541.7& 3 | 1.2 1 | 1079.9 | 15/2+ | 538.0 | 13/2− | | |
| 543.8 3 | 20.6 10 | 1561.0 | 21/2− | 1017.2 | 19/2− | | $I_\gamma$: Iγ(544,M1)/Iγ(560,E2)=0.59 7. |
| 544.6 3 | 1.0 1 | 1361.6 | 17/2+ | 816.9 | 13/2+ | E2 | R=1.11 9. |
| 559.6@ 3 | 37.7@ 19 | 1561.0 | 21/2− | 1001.4 | 17/2− | E2 | R=1.16 5. |
| 559.6@& 3 | 6.7@ 7 | 6616.9 | 51/2+ | 6057.3 | 49/2+ | | |
| 559.8 3 | 4.9 5 | 8240.7 | 59/2− | 7679.9 | 57/2− | | $E_\gamma$: poor fit, level-energy difference=560.8. |
| 559.9 3 | 12.3 6 | 4211.0 | 39/2− | 3651.0 | 35/2− | | |
| 561.2& 3 | 1.2 1 | 1079.9 | 15/2+ | 518.5 | 15/2− | | |
| 566.9 3 | 12.4 6 | 1646.7 | 19/2+ | 1079.9 | 15/2+ | | |
| 568.1 3 | 20.4 10 | 2129.1 | 23/2+ | 1561.0 | 21/2− | D | R=0.618 17. |

Continued on next page (footnotes at end of table)

**$^{124}$Sn($^{37}$Cl,6nγ) 2015Re03 (continued)**

γ($^{155}$Ho) (continued)

| Eγ[†] | Iγ[‡] | Ei(level) | $J^\pi_i$ | Ef | $J^\pi_f$ | Mult.[#] | Comments |
|---|---|---|---|---|---|---|---|
| 569.6[&] | <1 | 3834.2? | (33/2+) | 3264.6 | 29/2+ | | |
| 572.3 3 | 48.2 24 | 3489.4 | 35/2+ | 2917.1 | 31/2+ | E2 | R=1.09 6. |
| 575.8 3 | 9.5 10 | 3838.2 | 37/2+ | 3262.4 | 33/2+ | | |
| 581.1 3 | 22.7 11 | 9667.7 | 67/2+ | 9086.7 | 65/2+ | D(+Q) | R=0.67 4. |
| 583.0[&] 3 | 23.3 12 | 7535.4 | 55/2+ | 6952.4 | 53/2+ | | |
| 584.2 3 | 26.6 13 | 2189.0 | 25/2− | 1605.0 | 23/2− | D | Iγ: Iγ(584,M1)/Iγ(628,E2)=0.32 5.<br>R=0.72 14. |
| 587.9[@] 3 | 76.0[@] 38 | 1605.0 | 23/2− | 1017.2 | 19/2− | E2 | R=1.26 3. |
| 587.9[@] 3 | 19.6[@] 10 | 4493.6 | 41/2− | 3905.7 | 37/2− | E2 | R=1.13 3. |
| 588.0 3 | 3.0 3 | 11323.4 | (75/2−) | 10735.3 | (71/2−) | | |
| 589.4 3 | 4.5 5 | 1669.2 | 19/2+ | 1079.9 | 15/2+ | | |
| 592.9 3 | 23.8 12 | 3657.3 | 35/2+ | 3064.5 | 31/2+ | | |
| 593.3 3 | 6.0 6 | 2858.6 | 29/2− | 2265.2 | 27/2− | | Iγ: Iγ(593,M1)/Iγ(670,E2)=0.36 4. |
| 596.9 3 | 13.7 7 | 4875.3 | 43/2+ | 4278.1 | 39/2+ | | |
| 600.3 3 | 26.2 13 | 3064.5 | 31/2+ | 2464.2 | 27/2+ | | |
| 611.1 3 | 3.6 4 | 1972.7 | 21/2+ | 1361.6 | 17/2+ | E2 | R=1.23 6. |
| 611.5 3 | 9.0 9 | 2876.6 | (29/2+) | 2265.2 | 27/2− | | |
| 613.5 3 | 33.6 17 | 11035.9 | 75/2− | 10422.5 | 71/2− | E2 | R=1.25 7. |
| 620.0 | <1 | 13759.0 | (87/2) | 13139.0 | (85/2+) | | |
| 620.9 3 | 15.6 8 | 4278.1 | 39/2+ | 3657.3 | 35/2+ | | |
| 622.4 3 | 12.3 6 | 10290.0 | 71/2+ | 9667.7 | 67/2+ | E2 | R=1.53 13. |
| 626.7 3 | 21.0 11 | 4837.7 | 43/2− | 4211.0 | 39/2− | E2 | R=1.19 6. |
| 627.7 3 | 6.0 6 | 2296.9 | 23/2+ | 1669.2 | 19/2+ | E2 | R=1.19 6. |
| 628.1 3 | 46.0 23 | 2189.0 | 25/2− | 1561.0 | 21/2− | E2 | R=1.2 7. |
| 629.5 3 | 4.5 5 | 1646.7 | 19/2+ | 1017.2 | 19/2− | | |
| 630.6 3 | 58.6 29 | 4120.1 | 39/2+ | 3489.4 | 35/2+ | E2 | R=1.20 5. |
| 638.1 3 | 32.0 16 | 9543.5 | 67/2− | 8905.3 | 65/2− | (M1+E2) | R=0.51 3. |
| 638.3 3 | 18.0 9 | 11674.2 | 79/2− | 11035.9 | 75/2− | E2 | R=1.10 7. |
| 638.4[&] 3 | 9.1 9 | 2935.3 | (27/2+) | 2296.9 | 23/2+ | | |
| 643.8 3 | 1.5 2 | 2616.5 | 25/2+ | 1972.7 | 21/2+ | | |
| 645.3 3 | 4.1 4 | 1646.7 | 19/2+ | 1001.4 | 17/2− | | |
| 648.1 3 | | 3264.6 | 29/2+ | 2616.5 | 25/2+ | | |
| 650.0 | <1 | 5786.3 | (45/2+) | 5135.5 | (41/2+) | | |
| 650.9 3 | 13.5 7 | 4489.1 | 41/2+ | 3838.2 | 37/2+ | E2 | R=1.60 23. |
| 660.1 3 | 55.9 28 | 2265.2 | 27/2− | 1605.0 | 23/2− | E2 | R=1.15 4. |
| 669.7 3 | 23.5 12 | 2858.6 | 29/2− | 2189.0 | 25/2− | | |
| 673.2 3 | 21.8 11 | 3651.0 | 35/2− | 2977.8 | 31/2− | E2 | R=1.21 3. |
| 673.4 3 | 19.9 10 | 5167.1 | 45/2− | 4493.6 | 41/2− | | |
| 675.4 3 | 34.7 17 | 6843.2 | 53/2+ | 6167.9 | 49/2+ | E2 | R=1.13 8. |
| 684.8 3 | 2.2 2 | 13139.0 | (85/2+) | 12454.0 | (81/2+) | E2 | R=1.17 11. |
| 708.9 3 | 15.4 8 | 5546.6 | 47/2− | 4837.7 | 43/2− | E2 | R=0.98 11. |
| 712.5 3 | 38.2 19 | 2977.8 | 31/2− | 2265.2 | 27/2− | E2 | R=1.14 4. |
| 725.3 3 | 13.0 7 | 5214.4 | 45/2+ | 4489.1 | 41/2+ | E2 | R=1.07 5. |
| 743.7 3 | 6.0 6 | 9649.1 | (67/2−) | 8905.3 | 65/2− | D+Q | R=0.70 10. |
| 746.8 3 | 6.9 7 | 10177.4 | 69/2+ | 9430.3 | 65/2+ | E2 | R=1.08 15. |
| 755.3 3 | 22.3 11 | 4875.3 | 43/2+ | 4120.1 | 39/2+ | E2 | R=1.23 19. |
| 765.3 3 | 17.2 9 | 5932.4 | 49/2− | 5167.1 | 45/2− | E2 | R=1.12 5. |
| 775.2 3 | 5.7 6 | 8486.4 | 61/2− | 7711.0 | 57/2− | E2 | R=1.18 18. |
| 776.1 3 | 26.2 13 | 6167.9 | 49/2+ | 5392.0 | 45/2+ | E2 | R=0.99 7. |
| 779.7 3 | 3.0 3 | 12454.0 | (81/2+) | 11674.2 | 79/2− | | |
| 785.9 3 | 10.6 5 | 6843.2 | 53/2+ | 6057.3 | 49/2+ | E2 | R=1.07 15. |
| 791.2 3 | 12.4 6 | 5392.0 | 45/2+ | 4601.2 | 41/2+ | E2 | R=1.15 16. |
| 794.9 3 | 12.2 6 | 6341.5 | 51/2− | 5546.6 | 47/2− | E2 | R=0.91 9. |
| 801.8 3 | 5.4 5 | 9543.5 | 67/2− | 8741.8 | 63/2− | E2 | R=1.07 16. |

Continued on next page (footnotes at end of table)

## $^{124}$Sn($^{37}$Cl,6nγ) 2015Re03 (continued)

### γ($^{155}$Ho) (continued)

| $E_\gamma$ [†] | $I_\gamma$ [‡] | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult. [#] | Comments |
|---|---|---|---|---|---|---|---|
| 804.3 3 | 8.2 8 | 8515.3 | 61/2⁻ | 7711.0 | 57/2⁻ | | |
| 807.6 3 | 4.5 5 | 8486.4 | 61/2⁻ | 7679.9 | 57/2⁻ | | $E_\gamma$: poor fit, level-energy difference=806.5. |
| 810.8 3 | 5.3 5 | 11330.4 | (73/2⁻) | 10519.6 | 69/2⁻ | | |
| 820.0 3 | 3.0 3 | 8240.7 | 59/2⁻ | 7420.8 | (55/2⁻) | | |
| 834.7 3 | 20.0 10 | 5710.0 | 47/2⁺ | 4875.3 | 43/2⁺ | E2 | R=0.85 5. |
| 835.2 3 | 10.0 5 | 8515.3 | 61/2⁻ | 7679.9 | 57/2⁻ | E2 | R=0.75 7. |
| 841.3 3 | 18.1 9 | 6773.7 | 53/2⁻ | 5932.4 | 49/2⁻ | E2 | R=0.92 4. |
| 842.8 3 | 26.1 13 | 6057.3 | 49/2⁺ | 5214.4 | 45/2⁺ | E2 | R=0.93 17. |
| 845.0 3 | 3.0 3 | 7420.8 | (55/2⁻) | 6575.8 | (51/2⁻) | | |
| 851.5 | <1 | 8273.3 | (59/2⁻) | 7420.8 | (55/2⁻) | | |
| 852.7 3 | 16.0 8 | 7194.3 | 55/2⁻ | 6341.5 | 51/2⁻ | E2 | R=1.10 11. |
| 859.2 3 | 11.1 6 | 8053.7 | 59/2⁻ | 7194.3 | 55/2⁻ | E2 | R=1.03 15. |
| 864.9 3 | 18.0 9 | 9086.7 | 65/2⁺ | 8221.9 | 61/2⁺ | E2 | R=1.18 11. |
| 867.7 3 | 11.3 6 | 7820.0 | 57/2⁺ | 6952.4 | 53/2⁺ | E2 | R=0.99 22. |
| 869.7 3 | 6.5 7 | 11159.7 | (73/2⁺) | 10290.0 | 71/2⁺ | | |
| 870.7 3 | 7.0 7 | 8924.3 | 63/2⁻ | 8053.7 | 59/2⁻ | | |
| 879.1 3 | 31.3 16 | 10422.5 | 71/2⁻ | 9543.5 | 67/2⁻ | E2 | R=1.18 10. |
| 892.5 3 | 10.8 5 | 9279.2 | 65/2⁺ | 8387.1 | 61/2⁺ | E2 | R=1.03 23. |
| 892.7 3 | 6.2 6 | 13489.5 | 85/2 | 12596.9 | 81/2 | E2 | R=1.02 5. |
| 895.1 3 | 12.9 6 | 6952.4 | 53/2⁺ | 6057.3 | 49/2⁺ | E2 | R=1.11 18. |
| 898.4 3 | 7.8 8 | 10177.4 | 69/2⁺ | 9279.2 | 65/2⁺ | E2 | R=0.88 10. |
| 900.1 3 | 4.3 4 | 10858.2 | (71/2⁻) | 9958.1 | 67/2⁻ | | |
| 902.1 3 | 3.7 4 | 10519.6 | 69/2⁻ | 9617.5 | 65/2⁻ | E2 | R=1.19 12. |
| 902.9 3 | 9.8 10 | 5392.0 | 45/2⁺ | 4489.1 | 41/2⁺ | E2 | R=1.22 13. |
| 906.5 3 | 10.1 5 | 7679.9 | 57/2⁻ | 6773.7 | 53/2⁻ | E2 | R=1.10 8. |
| 906.9 3 | 12.1 6 | 6616.9 | 51/2⁺ | 5710.0 | 47/2⁺ | E2 | R=0.95 17. |
| 918.5 3 | 11.6 6 | 7535.4 | 55/2⁺ | 6616.9 | 51/2⁺ | E2 | R=1.5 4. |
| 922.9 3 | 7.2 7 | 12596.9 | 81/2 | 11674.2 | 79/2⁻ | D | Mult.: ΔJ=1 transition from R=0.75 9. Commented by 2015Re03 is that this is might be E1, but this is not adopted the table or the drawing of the level scheme. |
| 930.1 3 | 18.5 9 | 8221.9 | 61/2⁺ | 7291.9 | 57/2⁺ | E2 | R=1.13 8. |
| 937.1 3 | 6.5 7 | 7711.0 | 57/2⁻ | 6773.7 | 53/2⁻ | E2 | R=1.44 24. |
| 948.8 3 | 6.1 6 | 8240.7 | 59/2⁻ | 7291.9 | 57/2⁺ | D | R=0.51 9. |
| 982.2 3 | 3.4 3 | 11159.7 | (73/2⁺) | 10177.4 | 69/2⁺ | | |
| 997.4 3 | 1.5 2 | 14554.2 | 87/2⁻ | 13556.8 | 83/2⁻ | E2 | R=0.92 14. |
| 1015.4 3 | 2.0 2 | 5135.5 | (41/2⁺) | 4120.1 | 39/2⁺ | D(+Q) | R=0.51 4. |
| 1033.9 3 | 5.8 6 | 9958.1 | 67/2⁻ | 8924.3 | 63/2⁻ | E2 | R=1.5 3. |
| 1042.4 3 | 3.9 4 | 9430.3 | 65/2⁺ | 8387.1 | 61/2⁺ | | |
| 1057.1 3 | 8.8 9 | 9279.2 | 65/2⁺ | 8221.9 | 61/2⁺ | E2 | R=0.97 3. |
| 1063.4 3 | 0.10 1 | 14202.5 | (89/2⁺) | 13139.0 | (85/2⁺) | | |
| 1086.2 3 | 5.0 5 | 10735.3 | (71/2⁻) | 9649.1 | (67/2⁻) | E2 | R=1.28 16. |
| 1095.1 3 | 6.2 6 | 8387.1 | 61/2⁺ | 7291.9 | 57/2⁺ | E2 | R=1.16 4. |
| 1102.2 3 | 2.9 3 | 9617.5 | 65/2⁻ | 8515.3 | 61/2⁻ | E2 | R=1.4 5. |
| 1142.9 3 | 0.8 1 | 14699.7 | 87/2⁻ | 13556.8 | 83/2⁻ | E2 | R=1.6 4. |
| 1159.6 3 | 0.7 1 | 12195.5 | 77/2⁺ | 11035.9 | 75/2⁻ | D(+Q) | R=0.72 9. |
| 1208.8 3 | 3.5 4 | 9430.3 | 65/2⁺ | 8221.9 | 61/2⁺ | E2 | R=1.20 12. |
| 1287.5 [&] | <1 | 14888.3 | (87/2⁻) | 13600.8 | 83/2⁻ | | |
| 1331.5 | <1 | 14888.3 | (87/2⁻) | 13556.8 | 83/2⁻ | | |
| 1598.3 3 | 1.6 2 | 14195.3 | 85/2⁻ | 12596.9 | 81/2 | E2 | R=1.00 12. |
| 1882.6 3 | 2.5 3 | 13556.8 | 83/2⁻ | 11674.2 | 79/2⁻ | E2 | R=1.23 9. |
| 1926.6 3 | 2.3 2 | 13600.8 | 83/2⁻ | 11674.2 | 79/2⁻ | E2 | R=1.12 8. |

[†] Uncertaintes are stated by 2015Re03 as 0.3 keV (the fitting code assumes 1 keV uncertainty in cases with no given uncertainty).

Continued on next page (footnotes at end of table)

## $^{124}$Sn($^{37}$Cl,6n$\gamma$) 2015Re03 (continued)

### $\gamma$($^{155}$Ho) (continued)

‡ Uncertainties assigned based on a general statement in 2015Re03 that these are <5% for I$\gamma$>10 and <10% for the weakest transitions. Authors further state that I$\gamma$ is much less than 1, when not listed, for which we adopted I$\gamma$ <1. For several levels, branching ratios were measured separately by gating on relevant transitions in the cascades. These are listed under comments.

# From measured angular-intensity ratio R in 2015Re03. For ΔJ=2 transitions 2015Re03 adopt E2 (also in agreement with the absence of M2 transitions for rotational bands regime), likewise adopted by evaluator. For ΔJ=1 transitions 2015Re03 adopt either E1 or M1+E2, based also on extra arguments (explicit or implicit) related to the level scheme. However based only on the R ratio for relatively pure transitions (R≈0.6) one cannot distinguish between E1 and M1 characters and consequently the evaluator confirmed only the D (dipole) characters. For stronger mixed transitions (R significantly different from 0.6) M1+E2 is more likely than the E1+M2 and such assignments are tentatively maintainted by the evaluator.

@ Multiply placed with intensity suitably divided.

& Placement of transition in the level scheme is uncertain.

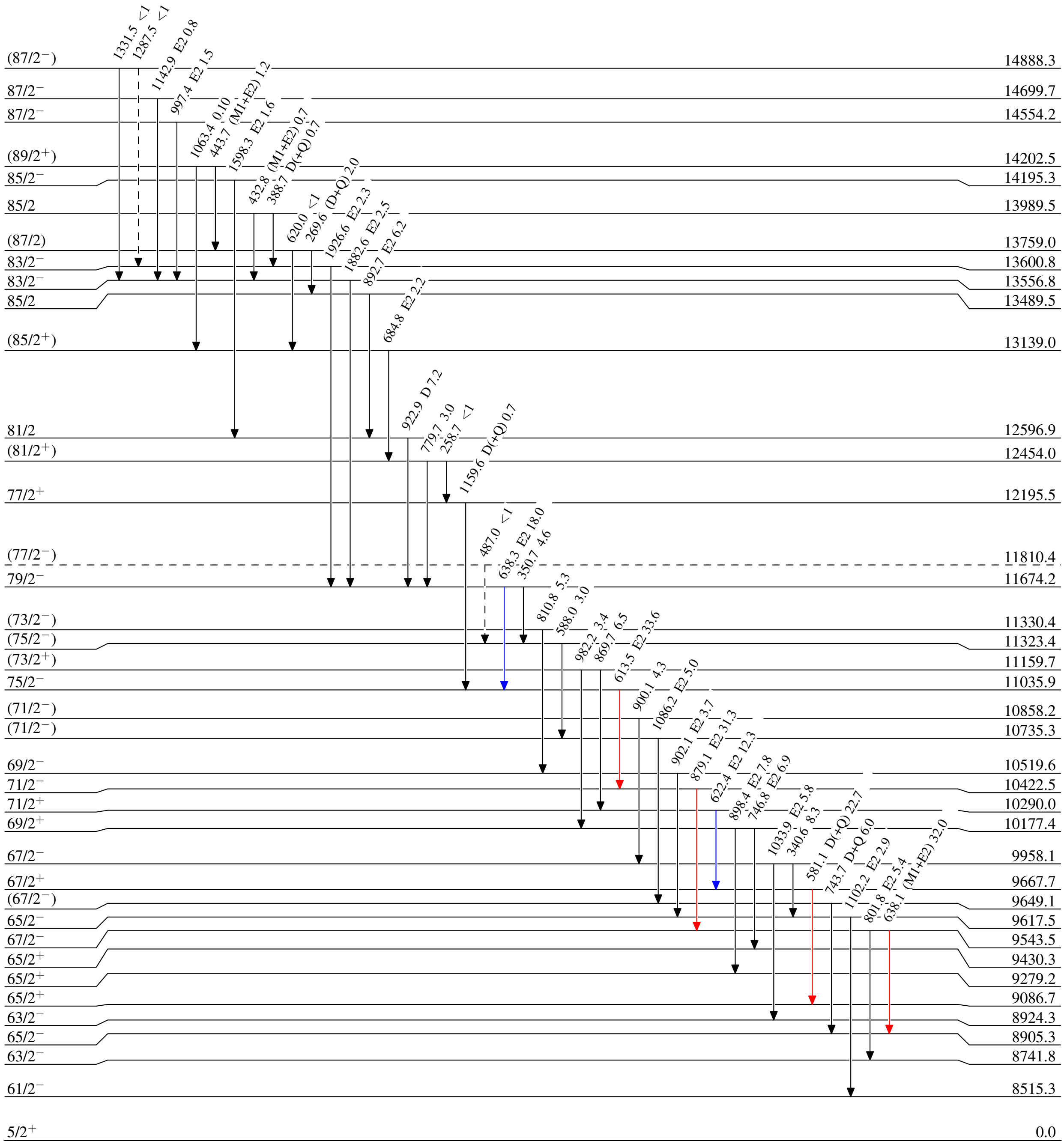
**$^{124}Sn(^{37}Cl,6n\gamma)$ 2015Re03**

Level Scheme

Intensities: Relative $I_\gamma$

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- $\gamma$ Decay (Uncertain)

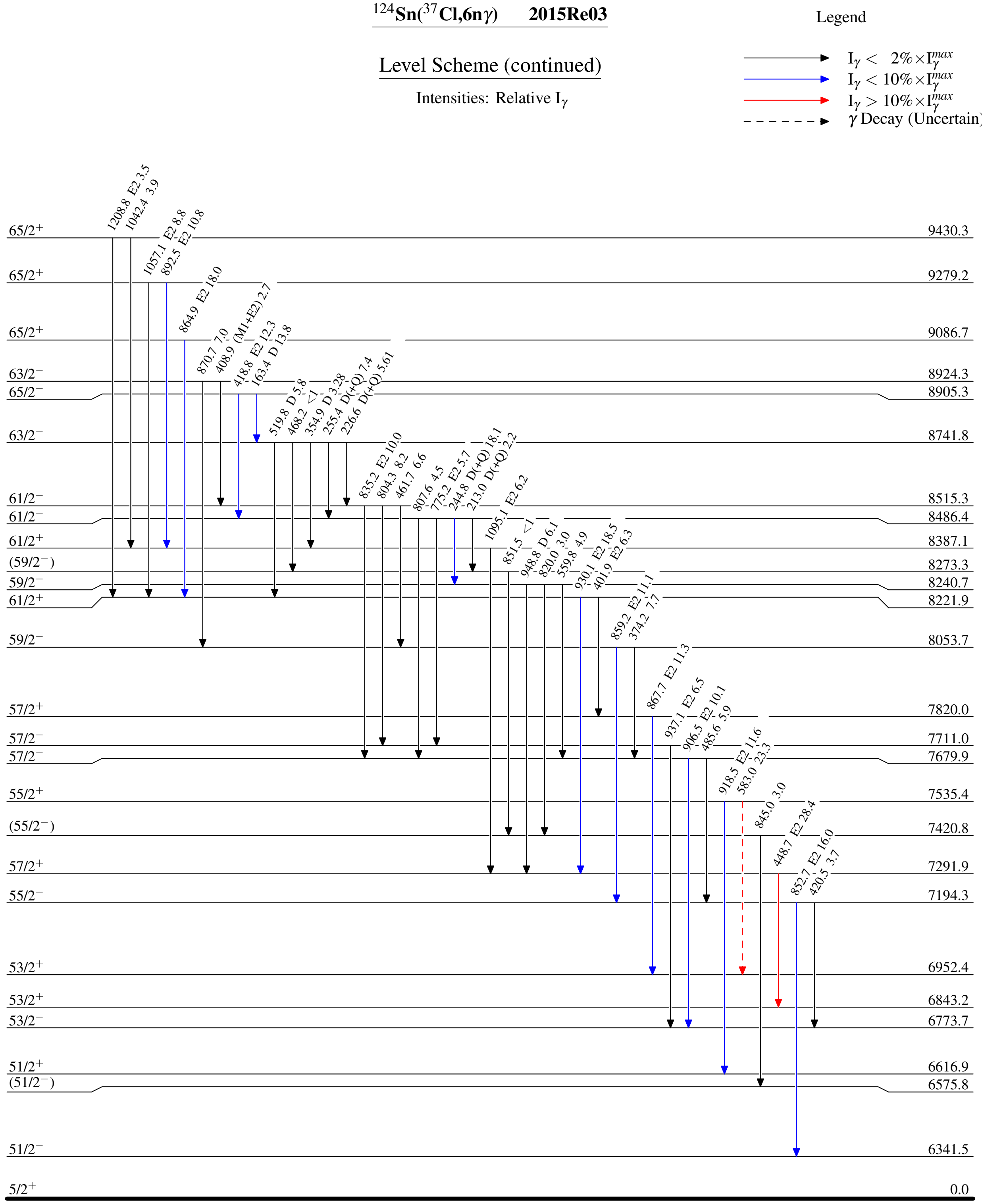



$^{155}_{67}Ho_{88}$

**$^{124}Sn(^{37}Cl,6n\gamma)$ 2015Re03**

Level Scheme (continued)

Intensities: Relative $I_\gamma$



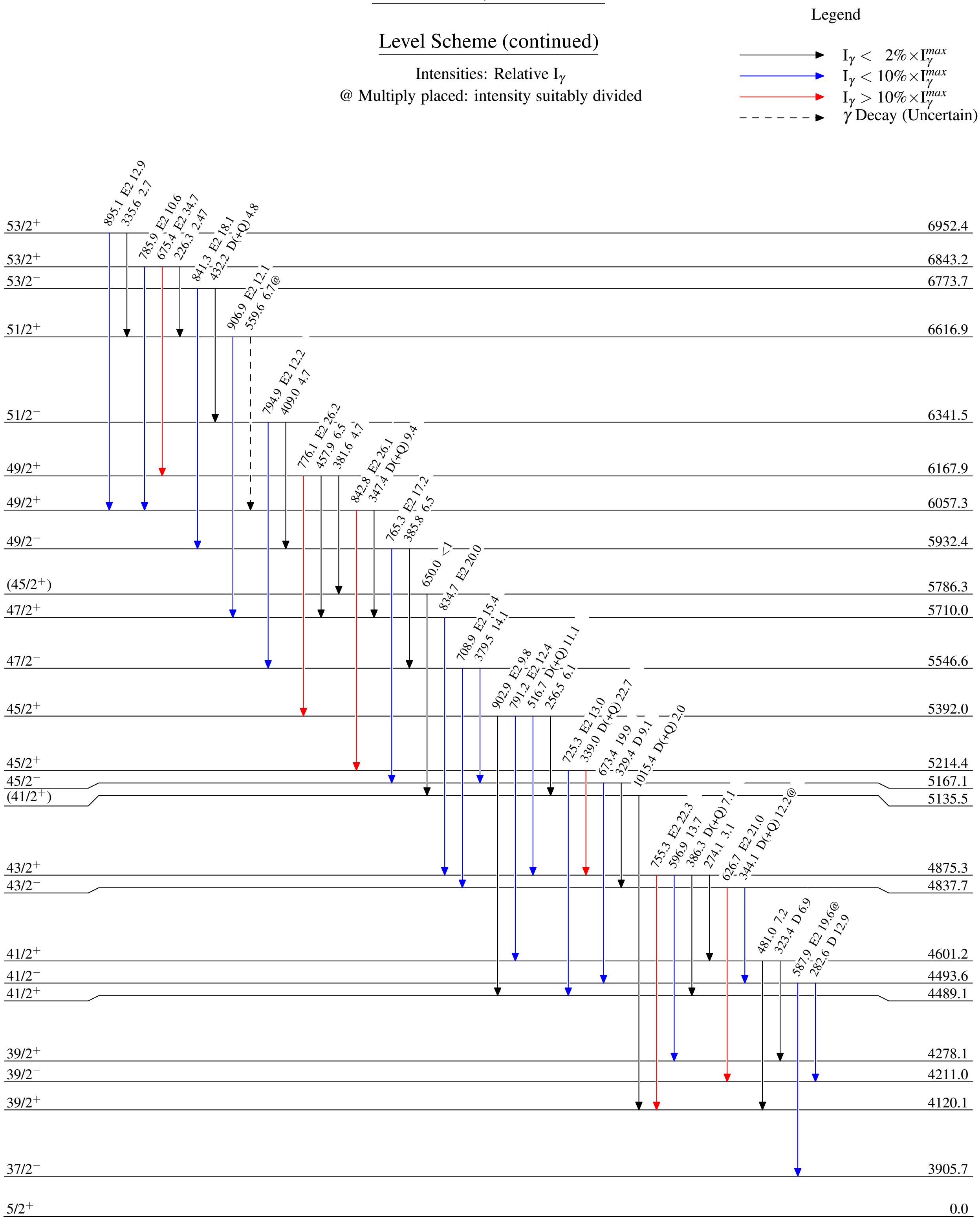

$^{155}_{67}Ho_{88}$

**$^{124}Sn(^{37}Cl,6n\gamma)$ 2015Re03**

Level Scheme (continued)

Intensities: Relative $I_\gamma$

@ Multiply placed: intensity suitably divided



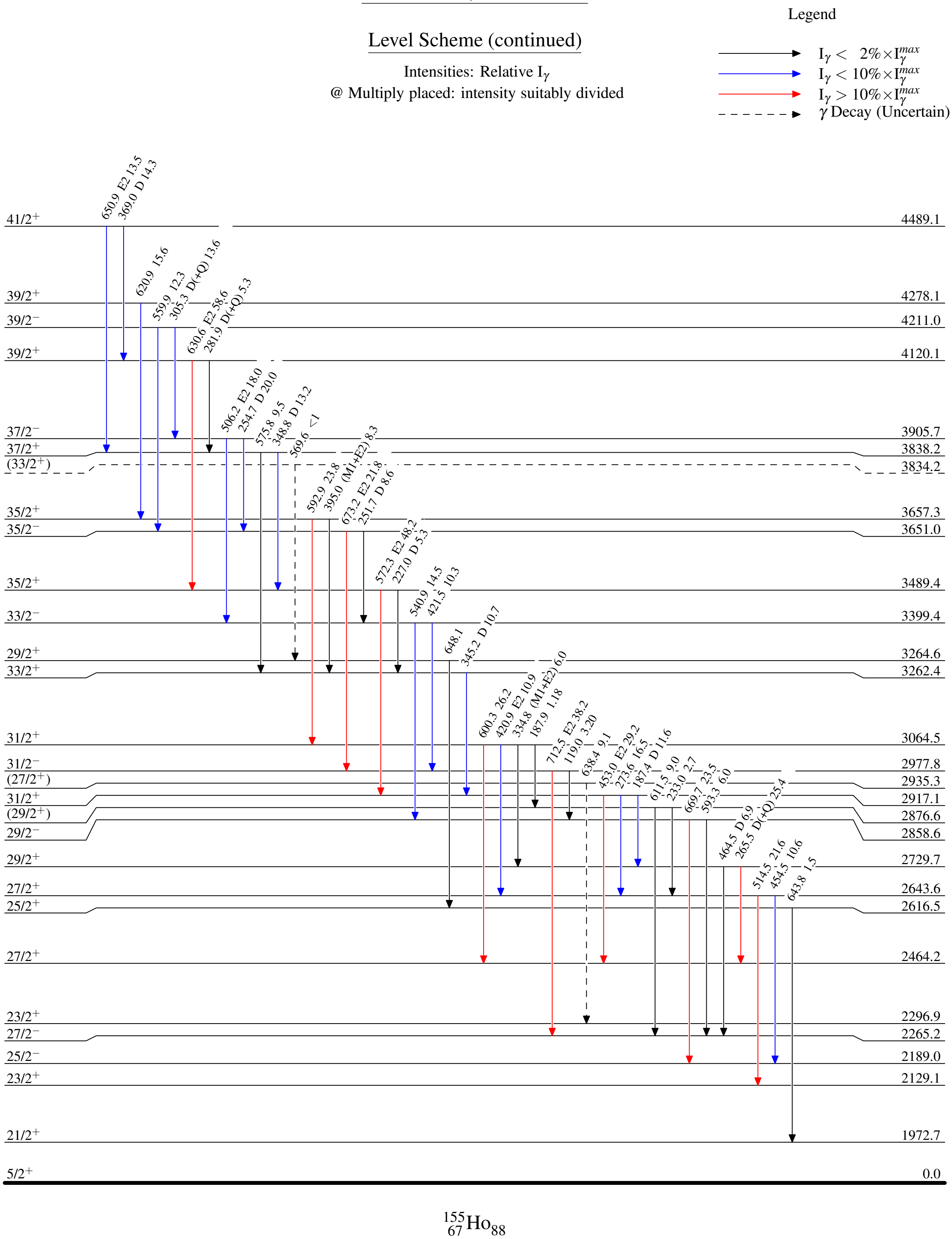

$^{155}_{67}Ho_{88}$

## $^{124}Sn(^{37}Cl,6n\gamma)$ 2015Re03

### Level Scheme (continued)

Intensities: Relative $I_\gamma$

@ Multiply placed: intensity suitably divided



## $^{124}Sn(^{37}Cl,6n\gamma)$ **2015Re03**

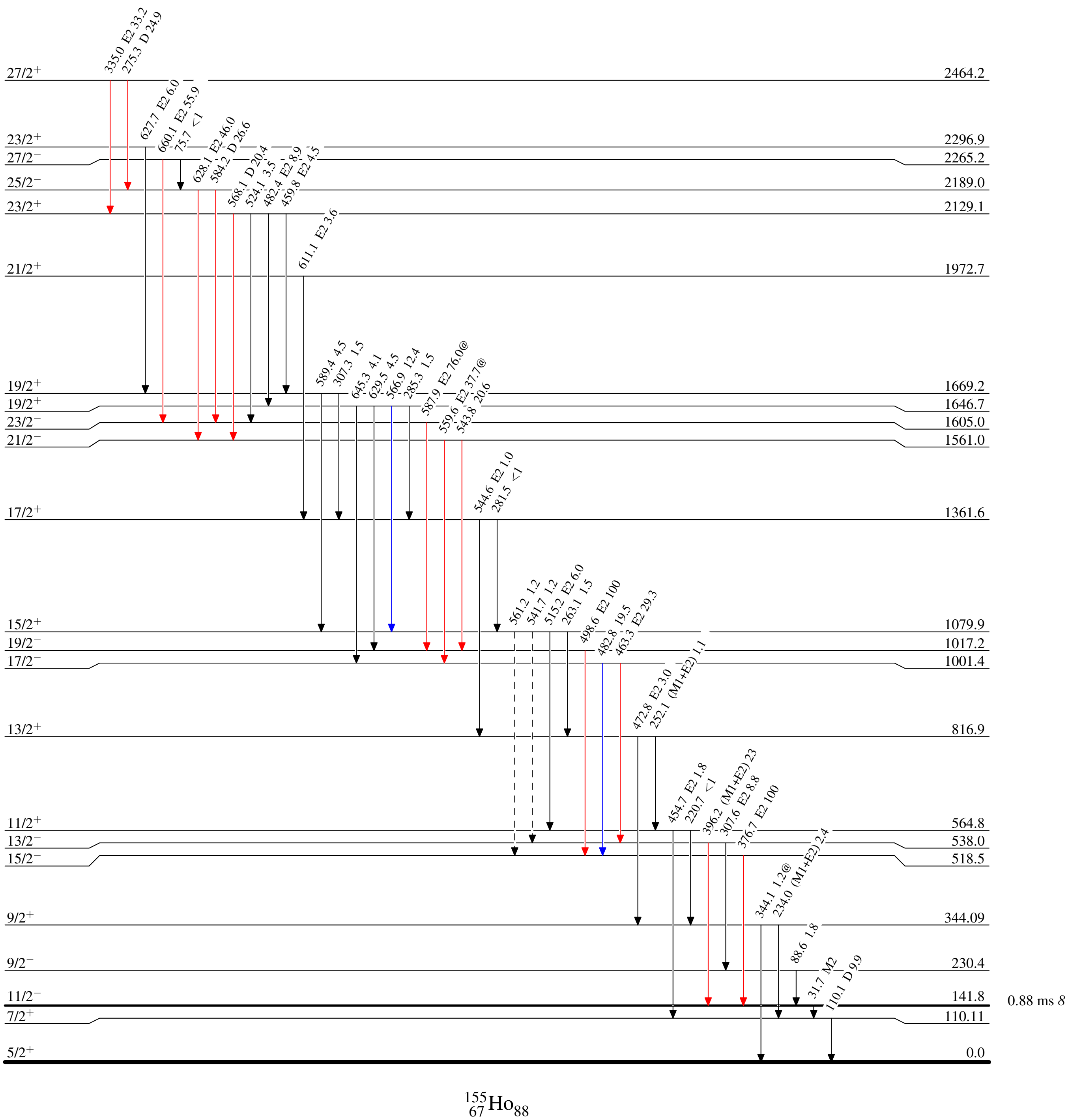
Level Scheme (continued)

Intensities: Relative $I_\gamma$

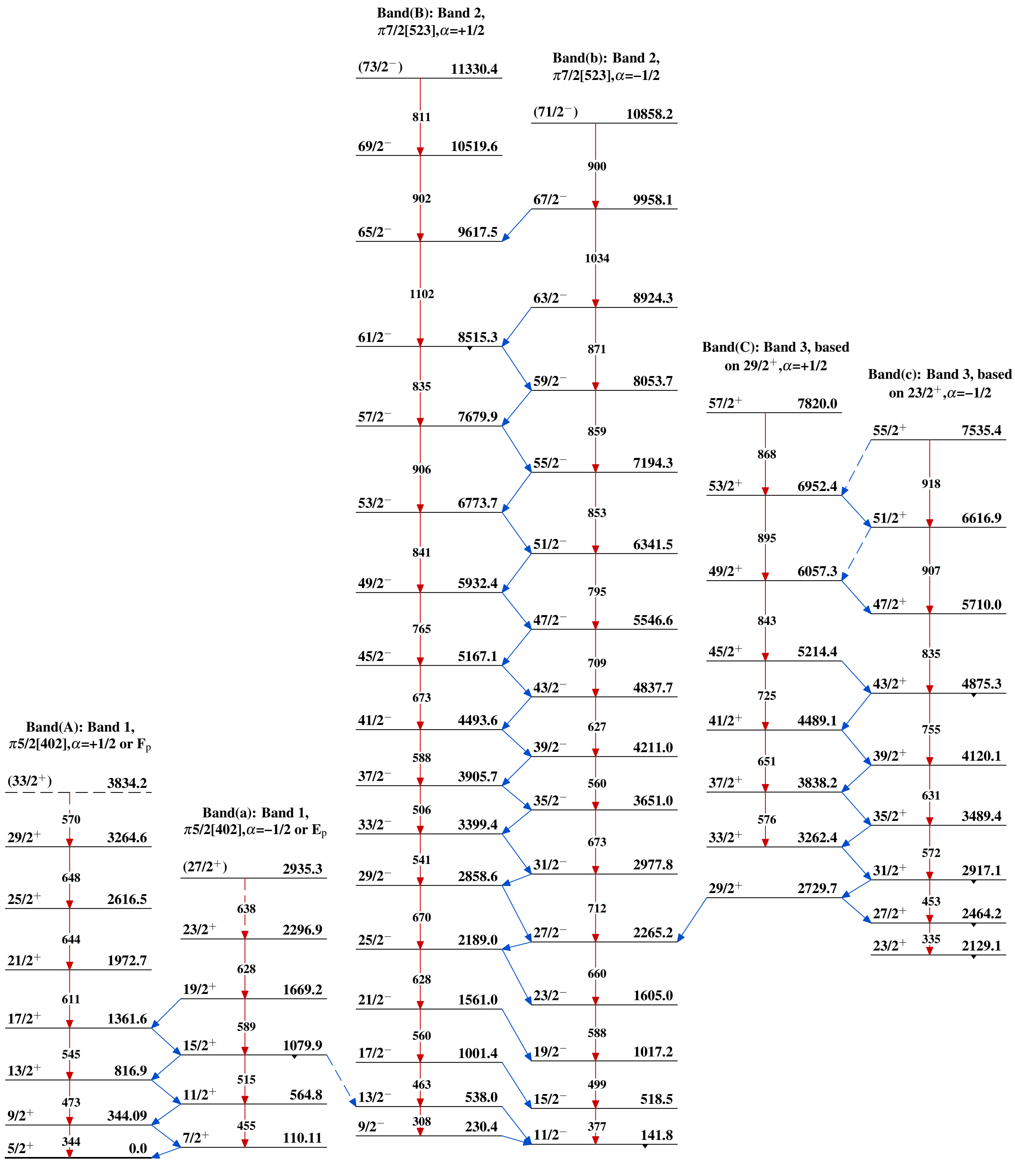
@ Multiply placed: intensity suitably divided

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- $\gamma$ Decay (Uncertain)

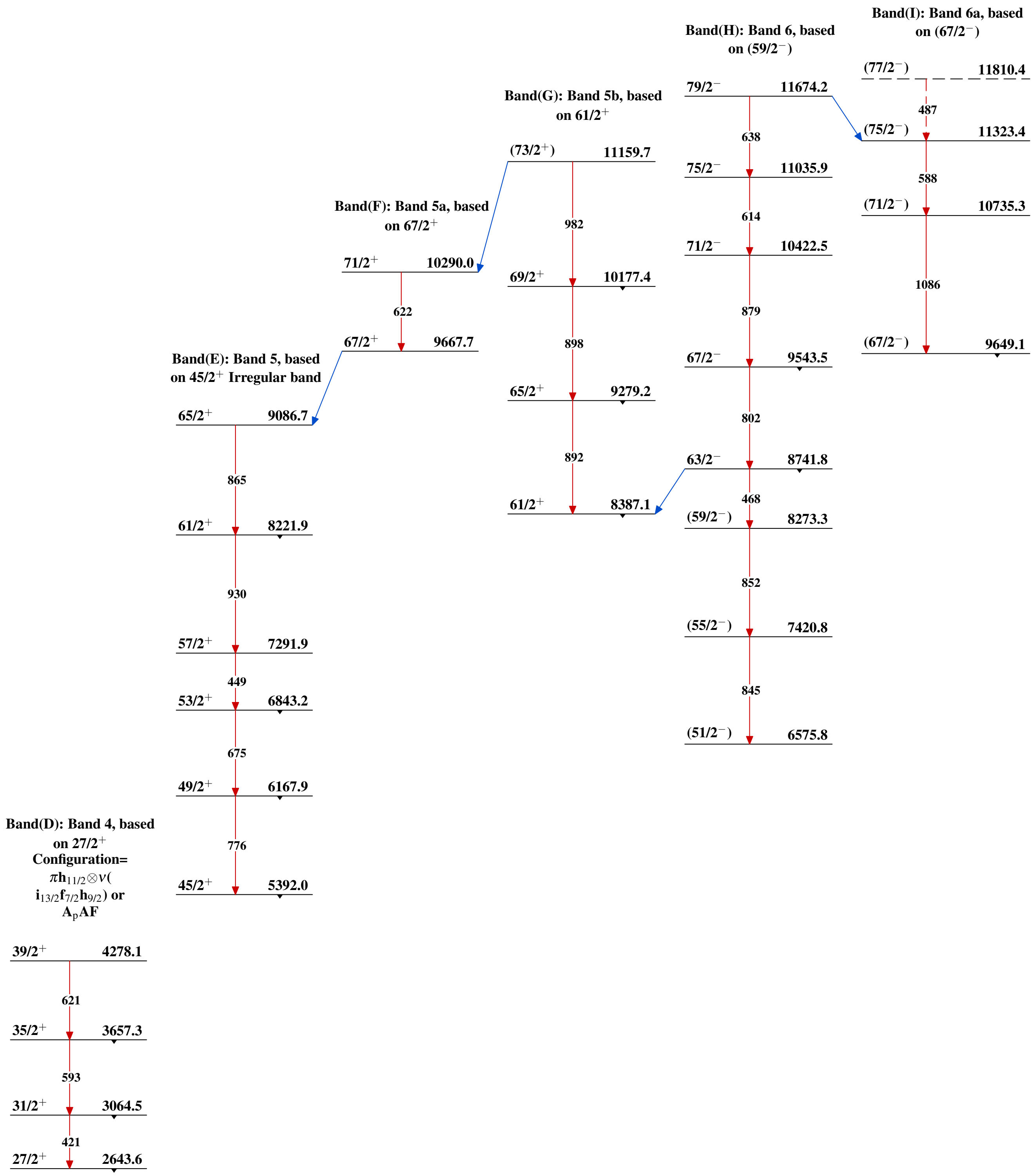


## $^{124}Sn(^{37}Cl,6n\gamma)$ 2015Re03



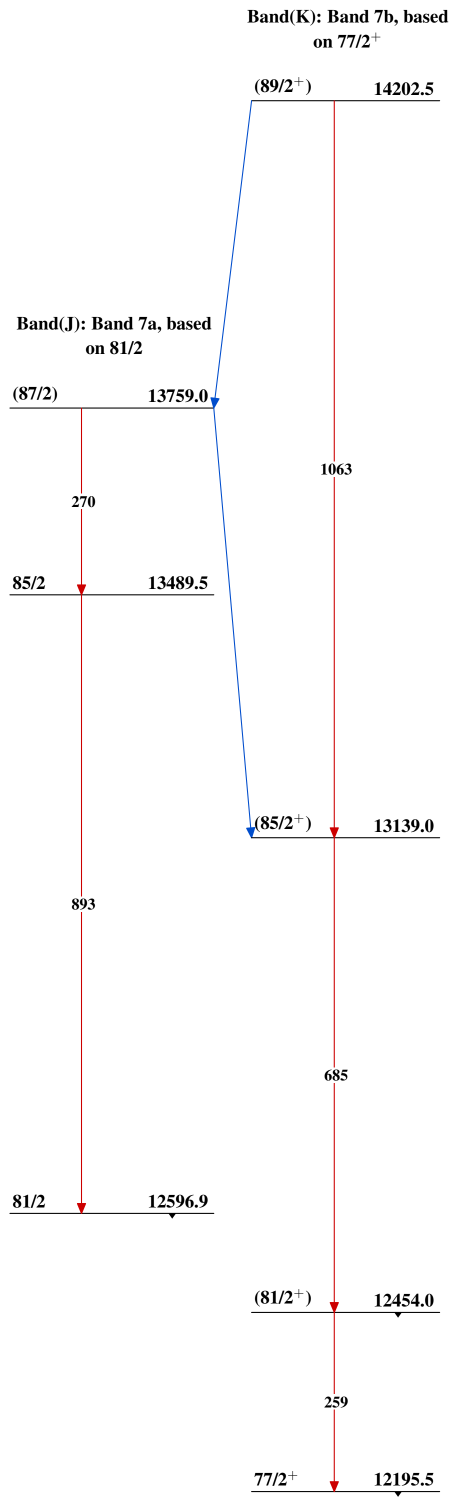

$^{155}_{67}Ho_{88}$

## $^{124}Sn(^{37}Cl,6n\gamma)$ 2015Re03 (continued)




$^{155}_{67}Ho_{88}$

## $^{124}$Sn($^{37}$Cl,6n$\gamma$) 2015Re03 (continued)




$^{155}_{67}Ho_{88}$