## $^{183}$W(n,n′γ) 1993Pr09

| History | | | |
|---|---|---|---|
| Type | Author | Citation | Literature Cutoff Date |
| Full Evaluation | Coral M. Baglin | NDS 134, 149 (2016) | 15-Apr-2015 |

Others: 1983BeZA (158 transitions), 1997Pr02.

1993Pr09: reactor fast neutrons; 96.3% enriched $^{183}$W metallic target; Ge detector (FWHM=1.9 keV At 1.3 MeV); measured Eγ (Eγ=40-2080), Iγ. See 1997Pr02 for further discussion of these data.

### $^{183}$W Levels

| E(level)† | Jπ‡ | Comments |
|---|---|---|
| 0.0# | 1/2− | |
| 46.49# 3 | 3/2− | |
| 99.011# 21 | 5/2− | |
| 206.955# 25 | 7/2− | |
| 208.750@ 22 | 3/2− | |
| 291.658@ 24 | 5/2− | |
| 308.84# 3 | 9/2− | |
| 309.06& 10 | 11/2+ | |
| 412.05@ 4 | 7/2− | |
| 452.93a 3 | 7/2− | |
| 475.12# 4 | 11/2− | |
| 551.15@ 3 | 9/2− | |
| 595.12a 4 | 9/2− | |
| 622.15b 10 | 9/2+ | |
| 630.99# 15 | 13/2− | |
| 739.88@ 5 | 11/2− | |
| 770.96? 8 | | proposed As 11/2− level In 1993Pr09 but level absent In 1997Pr02 so, In the absence of any other evidence for its existence, level is omitted from Adopted Levels. |
| 776.23b 13 | 11/2+ | |
| 776.9a 3 | 11/2− | |
| 904.04c 13 | 5/2− | |
| 934.67d 12 | 1/2− | |
| 963.44? 12 | (11/2,13/2) | |
| 999.57c 8 | 7/2− | |
| 1026.28d 10 | 3/2− | |
| 1052.33d 16 | 5/2− | |
| 1069.26e 10 | 7/2− | |
| 1149.17f 12 | 3/2− | |
| 1214.27 10 | | |
| 1223.24?e 14 | (9/2−) | evaluator considers existence of this level to be highly uncertain; the only γ deexciting it has an alternative placement. |
| 1308.91g 13 | 3/2− | |
| 1372.15g 15 | (5/2−) | |
| 1437.8 4 | 1/2−,3/2− | |
| 1469.75? 25 | 1/2− | |
| 1474.69 23 | (5/2−,7/2−) | |
| 1550.5h 4 | 5/2− | |
| 1557.3h 4 | 3/2− | |
| 1587.08 16 | (1/2−,3/2−) | |
| 1627.29 17 | 1/2−,3/2− | |

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## $^{183}$W(n,n′γ) 1993Pr09 (continued)

### $^{183}$W Levels (continued)

| E(level)[†] | Jπ[‡] |
|---|---|
| 1672.13 *18* | 1/2⁻,3/2⁻ |
| 1823.1 *4* | 1/2⁻,3/2⁻ |

† From least-squares fit to measured Eγ, omitting the 324γ and Eγ for doublets (102γ, 313γ, 1262γ, 1627γ), unless No other γ deexcites the level In question. reduced $\chi^2$ for fit is 2.4 cf. $\chi^2$(critical)=1.6.
‡ Authors′suggested values.
# Band(A): ν 1/2[510] g.s. band.
@ Band(B): ν 3/2[512] band.
& Band(C): ν 11/2[615] band.
a Band(D): ν 7/2[503] band.
b Band(E): ν 9/2[624] band.
c Band(F): ν 5/2[512] band.
d Band(G): ν 1/2[521] band.
e Band(H): ν 7/2[514] band.
f Band(I): Kπ=3/2⁻ band 1. Possible 7/2[503] K-2 γ vibration band.
g Band(J): Kπ=3/2⁻ band 2. Possible 1/2[510] K-2 γ vibration band.
h Band(K): ν 1/2[501] band.

### γ($^{183}$W)

| Eγ[†] | Iγ[†] | Ei(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Comments |
|---|---|---|---|---|---|---|
| 46.68 *21* | 230 *50* | 46.49 | 3/2⁻ | 0.0 | 1/2⁻ | |
| 52.73 *10* | 153 *30* | 99.011 | 5/2⁻ | 46.49 | 3/2⁻ | |
| 82.80 *17* | 26 *9* | 291.658 | 5/2⁻ | 208.750 | 3/2⁻ | |
| 84.71 | 68 *25* | 291.658 | 5/2⁻ | 206.955 | 7/2⁻ | Eγ: rounded value from Adopted Gammas. |
| 99.09 *3* | 186 *40* | 99.011 | 5/2⁻ | 0.0 | 1/2⁻ | |
| 102.10[&] *9* | 10.5[&] | 308.84 | 9/2⁻ | 206.955 | 7/2⁻ | Iγ: 12 *2* for doublet. |
| 102.10[&] *9* | 5.5[&] | 309.06 | 11/2⁺ | 206.955 | 7/2⁻ | Iγ: 12 *2* for doublet. |
| [x]106.44 *10* | 9.9 *20* | | | | | |
| 107.91 *3* | 280 *30* | 206.955 | 7/2⁻ | 99.011 | 5/2⁻ | |
| 109.81 *3* | 41 *3* | 208.750 | 3/2⁻ | 99.011 | 5/2⁻ | |
| 142.22 *3* | 63 *6* | 595.12 | 9/2⁻ | 452.93 | 7/2⁻ | |
| 144.12 *8* | 9.0 *19* | 452.93 | 7/2⁻ | 308.84 | 9/2⁻ | |
| 153.98[@] *10* | 6.1[@] *17* | 776.23 | 11/2⁺ | 622.15 | 9/2⁺ | placement from table 2 and text of 1997Pr02. This γ also deexcites an otherwise unknown 1223 level, according to 1993Pr09. |
| 153.98[@a] *10* | 6.1[@] *17* | 1223.24? | (9/2⁻) | 1069.26 | 7/2⁻ | |
| 160.39 *4* | 77 *7* | 206.955 | 7/2⁻ | 46.49 | 3/2⁻ | |
| 161.17 *5* | 64 *6* | 452.93 | 7/2⁻ | 291.658 | 5/2⁻ | |
| 162.27 *3* | 334 *26* | 208.750 | 3/2⁻ | 46.49 | 3/2⁻ | |
| 166.28 *3* | 30 *3* | 475.12 | 11/2⁻ | 308.84 | 9/2⁻ | |
| 175.84[a] *7* | 40 *7* | 770.96? | | 595.12 | 9/2⁻ | placement from 1993Pr09 only; not mentioned In 1997Pr02, so not ADOPTED. |
| 192.63 *6* | 9.3 *20* | 291.658 | 5/2⁻ | 99.011 | 5/2⁻ | |
| 203.22 *6* | 14 *2* | 412.05 | 7/2⁻ | 208.750 | 3/2⁻ | |
| 205.02 *3* | 32 *3* | 412.05 | 7/2⁻ | 206.955 | 7/2⁻ | |
| 208.72 *3* | 42 *4* | 208.750 | 3/2⁻ | 0.0 | 1/2⁻ | |
| 209.80 *3* | 169 *12* | 308.84 | 9/2⁻ | 99.011 | 5/2⁻ | |

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## $^{183}$W(n,n′γ) 1993Pr09 (continued)

### γ($^{183}$W) (continued)

| $E_\gamma$ † | $I_\gamma$ † | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Comments |
|---|---|---|---|---|---|---|
| 244.26 *4* | 34 *2* | 452.93 | 7/2⁻ | 208.750 | 3/2⁻ | |
| 245.94 *3* | 100 *3* | 452.93 | 7/2⁻ | 206.955 | 7/2⁻ | |
| 259.48 *4* | 23 *1* | 551.15 | 9/2⁻ | 291.658 | 5/2⁻ | |
| 264.81 *12* | 2.7 *6* | 739.88 | 11/2⁻ | 475.12 | 11/2⁻ | |
| 268.18 *3* | 26 *1* | 475.12 | 11/2⁻ | 206.955 | 7/2⁻ | |
| 291.61 *3* | 100 *4* | 291.658 | 5/2⁻ | 0.0 | 1/2⁻ | |
| 313.09& *3* | 89& | 412.05 | 7/2⁻ | 99.011 | 5/2⁻ | $I_\gamma$: 227 *9* for doublet. |
| 313.09& *3* | 138& | 622.15 | 9/2⁺ | 309.06 | 11/2⁺ | $I_\gamma$: 227 *9* for doublet. |
| 321.86 *21* | 14 *4* | 630.99 | 13/2⁻ | 308.84 | 9/2⁻ | |
| 323.96[a] *27* | 13.0 *4* | 776.9 | 11/2⁻ | 452.93 | 7/2⁻ | $I_\gamma$: from 1997Pr02; quoted As 13 *4* In 1993Pr09. placement from 1997Pr02; unplaced by 1993Pr09. |
| 327.77 *9* | 8 *2* | 739.88 | 11/2⁻ | 412.05 | 7/2⁻ | |
| 332.25 *17* | 8.8 *26* | 963.44? | (11/2,13/2) | 630.99 | 13/2⁻ | |
| x337.5#‡ *4* | 5.0‡ *15* | | | | | |
| 344.16 *5* | 12 *2* | 551.15 | 9/2⁻ | 206.955 | 7/2⁻ | |
| 353.94 *3* | 39 *1* | 452.93 | 7/2⁻ | 99.011 | 5/2⁻ | |
| 365.62 *10* | 14 *3* | 412.05 | 7/2⁻ | 46.49 | 3/2⁻ | |
| x382.83 *14* | 3.1 *6* | | | | | |
| x401.24 *13* | 8.3 *25* | | | | | |
| 404.60 *18* | 7.0 *21* | 999.57 | 7/2⁻ | 595.12 | 9/2⁻ | |
| 406.65 *21* | 6.8 *20* | 452.93 | 7/2⁻ | 46.49 | 3/2⁻ | |
| x414.57 *25* | 8 *3* | | | | | |
| x429.1 *4* | 4.5 *14* | | | | | |
| 431.05 *5* | 14 *2* | 739.88 | 11/2⁻ | 308.84 | 9/2⁻ | |
| 452.18 *4* | 13 *1* | 551.15 | 9/2⁻ | 99.011 | 5/2⁻ | |
| 467.35 *14* | 4.9 *27* | 776.23 | 11/2⁺ | 309.06 | 11/2⁺ | placed feeding 11/2⁺ 309 In table 2 and text of 1997Pr02; unplaced by 1993Pr09 and unobserved In 'Budapest' data from 2007ChZX. |
| 474.67 *15* | 4.0 *12* | 1069.26 | 7/2⁻ | 595.12 | 9/2⁻ | placement from table 2 and fig. 8 of 1997Pr02; γ unplaced by 1993Pr09. |
| x478.1 *4* | 4.0 *12* | | | | | |
| 488.41 *12* | 3.2 *8* | 963.44? | (11/2,13/2) | 475.12 | 11/2⁻ | |
| x491.30 *25* | 2.4 *7* | | | | | |
| 587.49 *9* | 6.7 *13* | 999.57 | 7/2⁻ | 412.05 | 7/2⁻ | |
| 611.98 *18* | 9.8 *25* | 904.04 | 5/2⁻ | 291.658 | 5/2⁻ | |
| x647.49 *26* | 7.5 *22* | | | | | |
| 652.41 *11* | 17 *2* | 1587.08 | (1/2⁻,3/2⁻) | 934.67 | 1/2⁻ | |
| 656.65 *22* | 5.8 *26* | 1069.26 | 7/2⁻ | 412.05 | 7/2⁻ | |
| x681.2 *4* | 6.7 *20* | | | | | |
| 695.69@ *18* | 49@ *10* | 904.04 | 5/2⁻ | 208.750 | 3/2⁻ | |
| 695.69@ *18* | 49@ *10* | 1149.17 | 3/2⁻ | 452.93 | 7/2⁻ | |
| 707.85 *26* | 16 *4* | 999.57 | 7/2⁻ | 291.658 | 5/2⁻ | |
| x729.9# *5* | 5.5 *17* | | | | | |
| 777.34 *15* | 18 *4* | 1069.26 | 7/2⁻ | 291.658 | 5/2⁻ | |
| 802.18 *10* | 14 *3* | 1214.27 | | 412.05 | 7/2⁻ | placement from 1997Pr02 (table 2); unplaced by 1993Pr09. |
| x805.09 *13* | 14 *3* | | | | | |
| 818.0 *5* | 8.5 *19* | 1026.28 | 3/2⁻ | 208.750 | 3/2⁻ | |
| 858.1[a] *4* | 6 *3* | 1149.17 | 3/2⁻ | 291.658 | 5/2⁻ | placement from 1993Pr09; γ omitted from table 2 and fig. 9 by 1997Pr02, so placement is shown As uncertain here. |
| 888.18 *11* | 52 *5* | 934.67 | 1/2⁻ | 46.49 | 3/2⁻ | |
| 923.2 *4* | 3.9 *19* | 1214.27 | | 291.658 | 5/2⁻ | placement from 1997Pr02 (table 2); this presumably supersedes 1993Pr09′s placement of this γ from the 1475 level. |

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## $^{183}$W(n,n′γ) 1993Pr09 (continued)

### γ($^{183}$W) (continued)

| $E_\gamma$ † | $I_\gamma$ † | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Comments |
|---|---|---|---|---|---|---|
| 927.8 *6* | 5.0 *25* | 1026.28 | 3/2$^-$ | 99.011 | 5/2$^-$ | |
| 940.77 *15* | 14 *3* | 1149.17 | 3/2$^-$ | 208.750 | 3/2$^-$ | |
| 953.29 *16* | 12 *3* | 1052.33 | 5/2$^-$ | 99.011 | 5/2$^-$ | |
| 959.80 *18* | 12 *3* | 1372.15 | (5/2$^-$) | 412.05 | 7/2$^-$ | |
| x976.3# *6* | 5.1 *25* | | | | | |
| 979.82 *15* | 25 *5* | 1026.28 | 3/2$^-$ | 46.49 | 3/2$^-$ | |
| x983.8 *10* | 3.5 *18* | | | | | |
| x995.63‡ *21* | 11‡ *4* | | | | | |
| 1006.5 *9* | 6.4 *22* | 1052.33 | 5/2$^-$ | 46.49 | 3/2$^-$ | |
| x1017.4 *3* | 7 *3* | | | | | |
| 1022.0 *4* | 4 *2* | 1474.69 | (5/2$^-$,7/2$^-$) | 452.93 | 7/2$^-$ | |
| 1026.19 *13* | 38 *4* | 1026.28 | 3/2$^-$ | 0.0 | 1/2$^-$ | |
| 1062.6 *3* | 10 *3* | 1474.69 | (5/2$^-$,7/2$^-$) | 412.05 | 7/2$^-$ | |
| x1066.1 *4* | 9.7 *3* | | | | | |
| x1075.74 *21* | 6.4 *19* | | | | | |
| 1081.10 *26* | 5.7 *17* | 1372.15 | (5/2$^-$) | 291.658 | 5/2$^-$ | |
| x1085.2 *4* | 3.5 *17* | | | | | |
| 1100.11 *13* | 14.6 *27* | 1308.91 | 3/2$^-$ | 208.750 | 3/2$^-$ | |
| x1103.93 *26* | 6.5 *19* | | | | | |
| 1149.7 *6* | 6 *3* | 1149.17 | 3/2$^-$ | 0.0 | 1/2$^-$ | |
| x1157.2 *3* | 8.6 *26* | | | | | |
| x1162.87 *27* | 27 *6* | | | | | |
| x1173.6# *5* | 12 *6* | | | | | |
| 1182.3 *8* | 11 *4* | 1474.69 | (5/2$^-$,7/2$^-$) | 291.658 | 5/2$^-$ | |
| x1189.8 *4* | 13 *3* | | | | | |
| x1193.1 *4* | 23 *5* | | | | | |
| x1230.4 *3* | 14 *3* | | | | | |
| x1259.3 *4* | 7 *3* | | | | | |
| 1262.9@ *4* | 7@ *3* | 1308.91 | 3/2$^-$ | 46.49 | 3/2$^-$ | |
| 1262.9@ *4* | 7@ *3* | 1469.75? | 1/2$^-$ | 206.955 | 7/2$^-$ | |
| x1280.9 *4* | 5.6 *17* | | | | | |
| x1287.4 *4* | 6.6 *19* | | | | | |
| x1296.0 *4* | 14 *3* | | | | | |
| x1405.9 *4* | 5.5 *17* | | | | | |
| 1423.2a *3* | 11 *3* | 1469.75? | 1/2$^-$ | 46.49 | 3/2$^-$ | |
| 1437.8 *4* | 7.3 *23* | 1437.8 | 1/2$^-$,3/2$^-$ | 0.0 | 1/2$^-$ | |
| x1455.07 *18* | 5.2 *16* | | | | | |
| 1504.0 *4* | 9.1 *27* | 1550.5 | 5/2$^-$ | 46.49 | 3/2$^-$ | placement from table 2 and fig. 9 of 1997Pr02. |
| 1510.7 *5* | 10 *3* | 1557.3 | 3/2$^-$ | 46.49 | 3/2$^-$ | |
| x1523.56 *26* | 7 *3* | | | | | |
| 1528.6 *3* | 6 *3* | 1627.29 | 1/2$^-$,3/2$^-$ | 99.011 | 5/2$^-$ | |
| 1557.4 *5* | 6 *3* | 1557.3 | 3/2$^-$ | 0.0 | 1/2$^-$ | |
| x1569.8 *3* | 7.0 *21* | | | | | |
| 1573.2 *3* | 7.0 *21* | 1672.13 | 1/2$^-$,3/2$^-$ | 99.011 | 5/2$^-$ | |
| 1580.6 *6* | 5.5 *28* | 1627.29 | 1/2$^-$,3/2$^-$ | 46.49 | 3/2$^-$ | |
| x1610.5 *6* | 6 *3* | | | | | |
| 1614.3 *4* | 8 *4* | 1823.1 | 1/2$^-$,3/2$^-$ | 208.750 | 3/2$^-$ | |
| 1627.13@ *22* | 6.9@ *21* | 1627.29 | 1/2$^-$,3/2$^-$ | 0.0 | 1/2$^-$ | |
| 1627.13@ *22* | 6.9@ *21* | 1672.13 | 1/2$^-$,3/2$^-$ | 46.49 | 3/2$^-$ | |
| x1631.4 *5* | 5.0 *15* | | | | | |
| x1652.6 *4* | 5.0 *15* | | | | | |
| x1690.35 *25* | 7.4 *22* | | | | | |
| x1794.1 *4* | 2.6 *13* | | | | | |
| x1836.7# *3* | 4.3 *22* | | | | | |

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## $^{183}$W(n,n′γ) 1993Pr09 (continued)

### γ($^{183}$W) (continued)

| $E_\gamma$ † | $I_\gamma$ † | $E_i$(level) |
|---|---|---|
| [x]1857.9[#] *7* | 4.8 *24* | |
| [x]2001.8 *6* | 4.4 *13* | |
| [x]2082.1 *3* | 3.7 *9* | |

† From 1993Pr09, except As noted. 1983BeZA report four additional transitions with Eγ(Iγ) As follows: 177.0 *2* (43 *11*), 319.4 *2* (14 *4*) from a 772 level and 202.3 *1* (24 *8*), 379.0 *2* (7 *2*) from a 974 level. these were not confirmed by 1993Pr09, so have not been adopted here.

‡ Transition contaminated with γ from $^{184}$W. $^{184}$W contribution to Iγ has been subtracted by authors of 1993Pr09.

# Assignment to $^{183}$W is tentative (1993Pr09).

@ Multiply placed with undivided intensity.

& Multiply placed with intensity suitably divided.

a Placement of transition in the level scheme is uncertain.

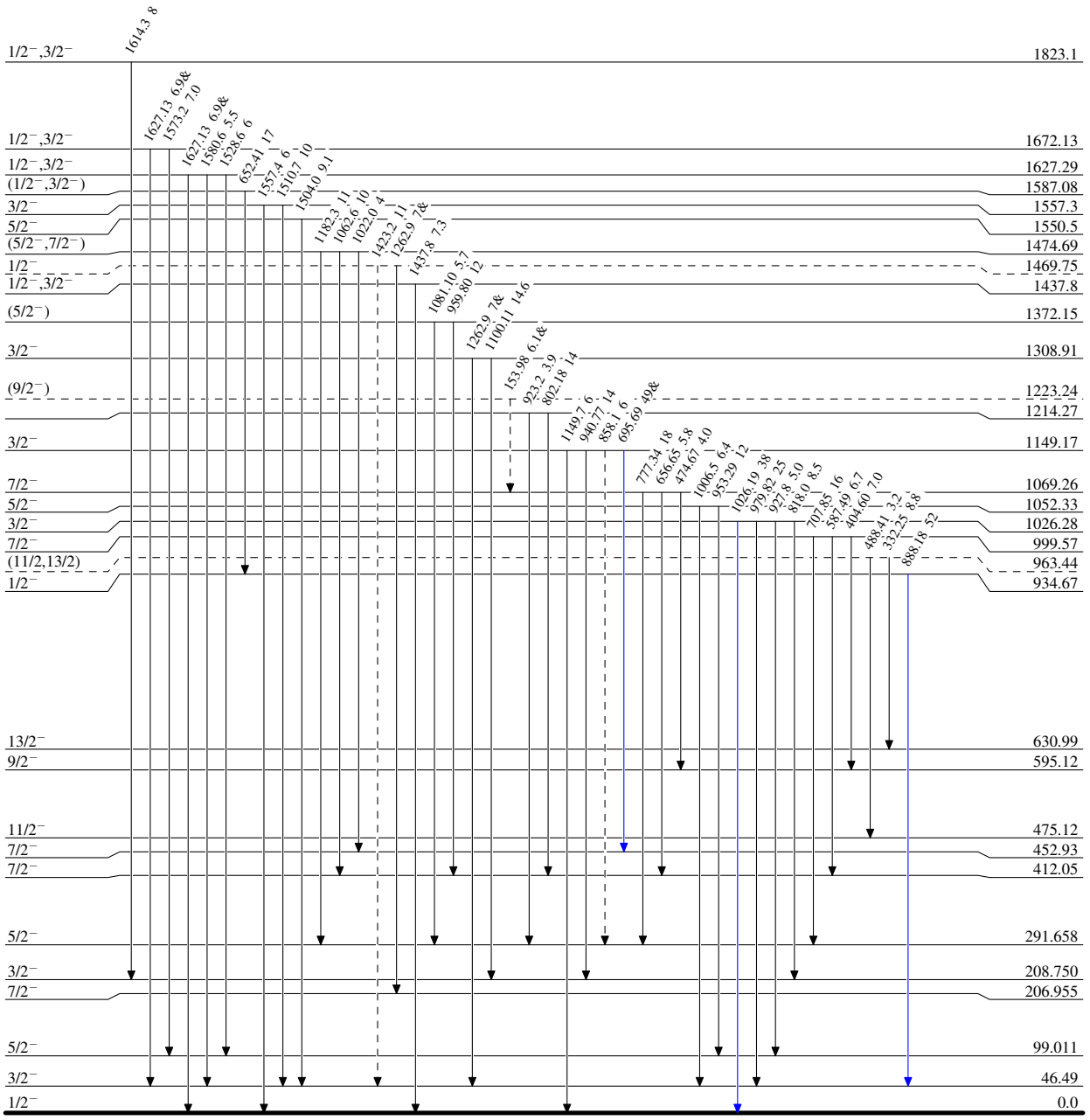
x γ ray not placed in level scheme.

## $^{183}$W(n,n′γ) 1993Pr09

### Level Scheme

Intensities: Relative $I_\gamma$
& Multiply placed: undivided intensity given

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)

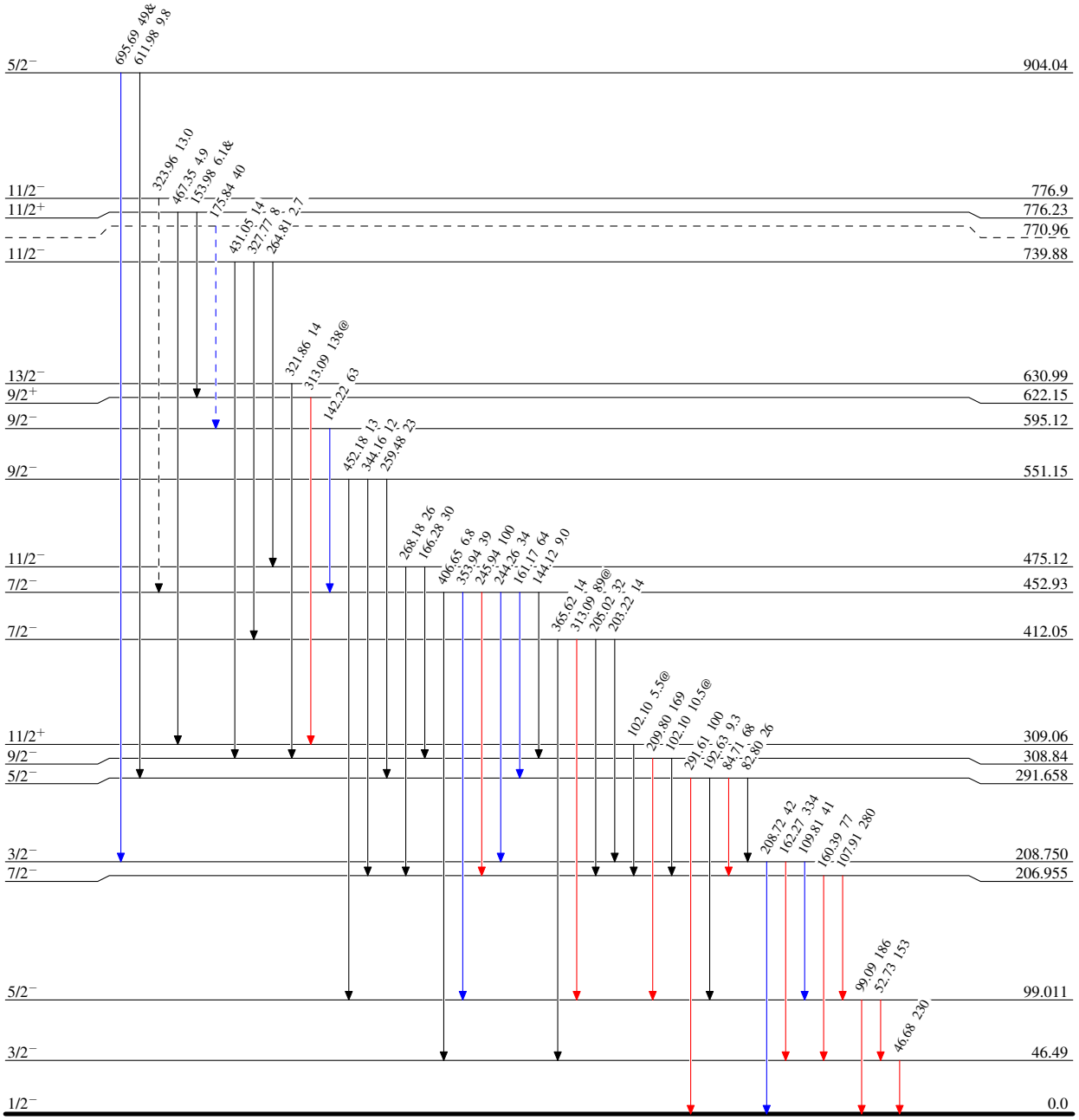


## $^{183}$W(n,n′γ) 1993Pr09

### Level Scheme (continued)

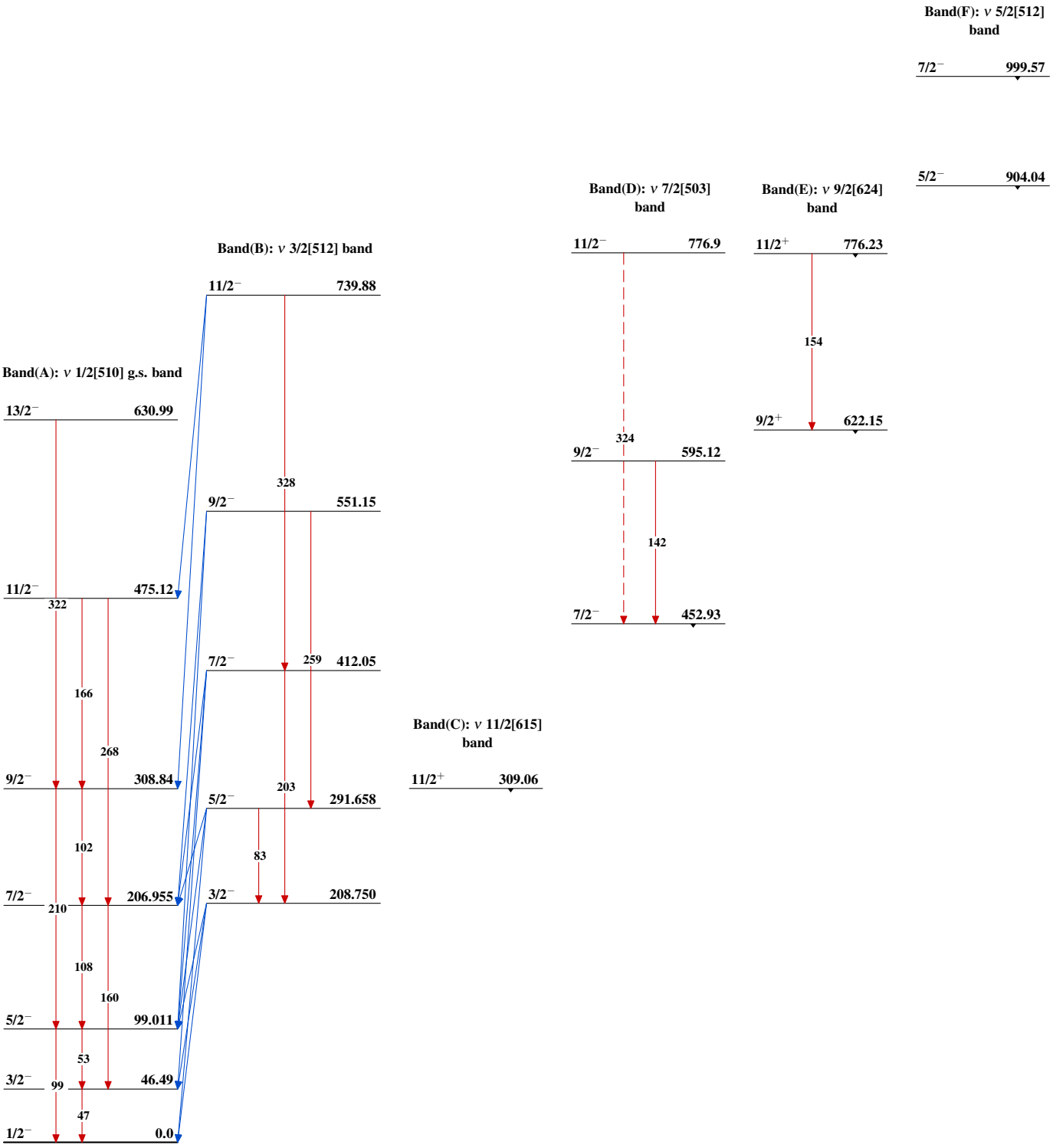
Intensities: Relative $I_\gamma$
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

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



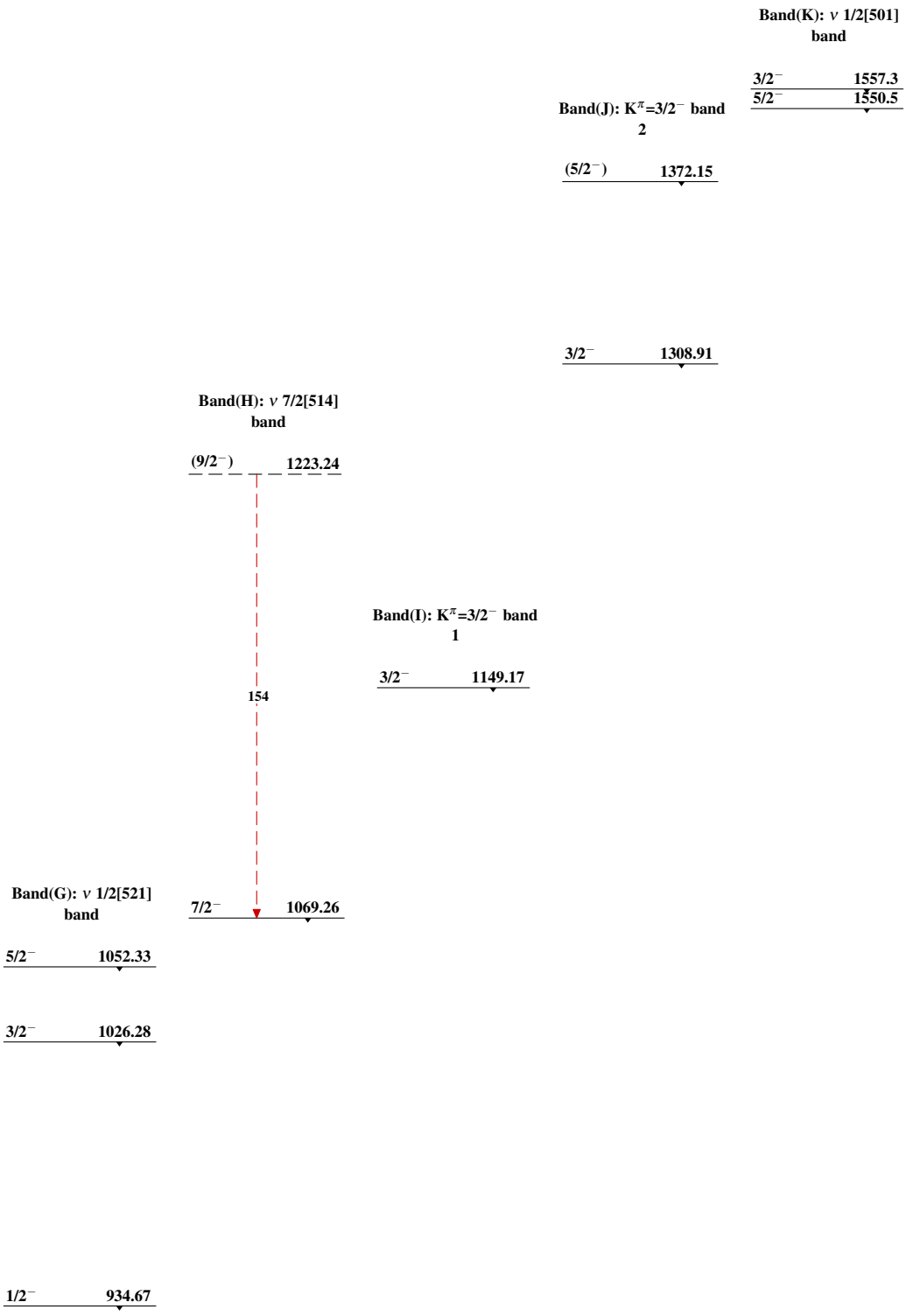

$^{183}_{74}W_{109}$

## $^{183}$W(n,n′γ) 1993Pr09




$^{183}_{74}W_{109}$

## $^{183}$W(n,n′γ) 1993Pr09 (continued)




$^{183}_{74}W_{109}$