



## Erratum: Identification of band structures and proposed one- and two-phonon $\gamma$ -vibrational bands in $^{105}\text{Mo}$ [Phys. Rev. C **74**, 054301 (2006)]

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We report several corrections to the original paper on  $^{105}\text{Mo}$ .

In our original publication of level schemes in Fig. 1, we defined level energies based on certain transitions and then adjusted the raw data for other transitions to fit those energies. This is not correct scientific procedure as it alters original data to match

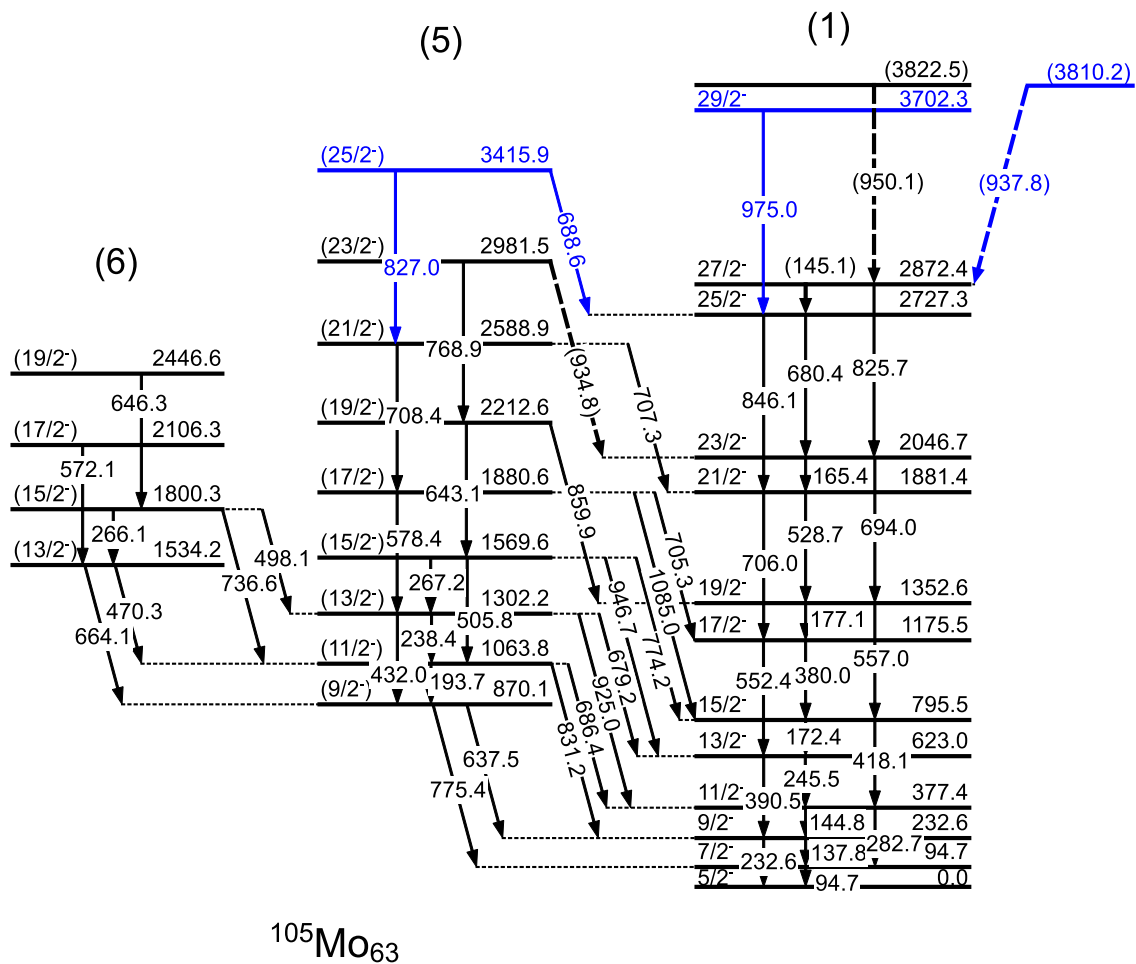


FIG. 1. Partial level scheme showing levels and transitions in  $^{105}\text{Mo}$ . Tentative transitions are labeled with parentheses. New levels and transitions are labeled in blue. Note that the tentative 3822.5 keV level is labeled without spin and parity because of the ambiguous assignments of the  $31/2^-$  state. See text for explanations. Note that the 145.2 and 934.8 keV transitions are reassigned as tentative in this erratum rather than firmly assigned as in the original paper.

TABLE I. List of the  $\gamma$ -ray transition energies and initial energy levels in keV in  $^{105}\text{Mo}$  obtained in this erratum. They are listed as “new” in the column and bold. The old energy values from Fig. 1 and Table I of the original paper are also listed for comparison. Tentative transitions are listed with parentheses. Note that in Table I of the original paper,  $E_i$  (initial level energy) and  $E_f$  (final level energy) labels were reversed by mistake. See text for more details.

| $E_\gamma$ |                | $E_i$    |               |
|------------|----------------|----------|---------------|
| Original   | New            | Original | New           |
| 63.7       | <b>63.4</b>    | 310.0    | <b>309.7</b>  |
| 64.5       | <b>64.4</b>    | 396.5    | <b>396.0</b>  |
| 85.7       | <b>85.2</b>    | 332.0    | <b>331.4</b>  |
| 94.9       | <b>94.7</b>    | 94.9     | <b>94.7</b>   |
| 102.3      | <b>101.9</b>   | 348.6    | <b>348.2</b>  |
| 115.8      | <b>115.5</b>   | 464.4    | <b>463.8</b>  |
| 128.3      | <b>128.0</b>   | 524.8    | <b>524.0</b>  |
| 138.1      | <b>137.8</b>   | 233.0    | <b>232.6</b>  |
| 138.3      | <b>138.2</b>   | 663.1    | <b>662.4</b>  |
| 139.2      | <b>139.0</b>   | 857.7    | <b>857.0</b>  |
| 142.1      | <b>142.0</b>   | 650.0    | <b>649.3</b>  |
| 145.0      | <b>144.8</b>   | 378.0    | <b>377.4</b>  |
| 145.2      | <b>(145.1)</b> | 2873.2   | <b>2872.4</b> |
| 150.2      | <b>149.9</b>   | 396.5    | <b>396.0</b>  |
| 154.4      | <b>154.1</b>   | 464.4    | <b>463.8</b>  |
| 155.2      | <b>155.1</b>   | 663.1    | <b>662.4</b>  |
| 159.3      | <b>159.0</b>   | 507.9    | <b>507.3</b>  |
| 165.2      | <b>165.4</b>   | 2047.4   | <b>2046.7</b> |
| 172.5      | <b>172.4</b>   | 796.3    | <b>795.5</b>  |
| 176.2      | <b>175.8</b>   | 524.8    | <b>524.0</b>  |
| 177.0      | <b>177.1</b>   | 1353.4   | <b>1352.6</b> |
| 185.6      | <b>185.4</b>   | 650.0    | <b>649.3</b>  |
| 192.8      | <b>192.6</b>   | 524.8    | <b>524.0</b>  |
| 193.9      | <b>193.7</b>   | 1064.4   | <b>1063.8</b> |
| 207.7      | <b>207.7</b>   | 857.7    | <b>857.0</b>  |
| 210.6      | <b>210.8</b>   | 718.5    | <b>718.0</b>  |
| 215.1      | <b>215.1</b>   | 310.0    | <b>309.7</b>  |
| 217.9      | <b>217.6</b>   | 881.0    | <b>879.9</b>  |
| 218.1      | <b>217.7</b>   | 464.4    | <b>463.8</b>  |
| 231.4      | <b>231.2</b>   | 464.4    | <b>463.8</b>  |
| 233.0      | <b>232.6</b>   | 233.0    | <b>232.6</b>  |
| 233.9      | <b>233.8</b>   | 857.7    | <b>857.0</b>  |
| 238.4      | <b>238.4</b>   | 1302.8   | <b>1302.2</b> |
| 245.8      | <b>245.5</b>   | 623.8    | <b>623.0</b>  |
| 246.3      | <b>246.2</b>   | 246.3    | <b>246.2</b>  |
| 246.6      | <b>246.3</b>   | 965.1    | <b>964.3</b>  |
| 253.7      | <b>253.5</b>   | 348.6    | <b>348.2</b>  |
| 260.8      | <b>260.5</b>   | 1118.4   | <b>1117.6</b> |
| 261.6      | <b>261.1</b>   | 507.9    | <b>507.3</b>  |
| 266.3      | <b>266.1</b>   | 1800.9   | <b>1800.3</b> |
| 266.6      | <b>266.4</b>   | 663.1    | <b>662.4</b>  |
| 267.6      | <b>267.2</b>   | 1570.4   | <b>1569.6</b> |
| 267.7      | <b>267.7</b>   | 1386.2   | <b>1385.4</b> |
| 272.0      | <b>272.2</b>   | 650.0    | <b>649.3</b>  |
| 274.9      | <b>274.7</b>   | 507.9    | <b>507.3</b>  |
| 278.5      | <b>277.7</b>   | 524.8    | <b>524.0</b>  |
| 279.6      | <b>279.7</b>   | 1244.7   | <b>1244.1</b> |
| 283.1      | <b>282.7</b>   | 378.0    | <b>377.4</b>  |
| 301.4      | <b>301.0</b>   | 650.0    | <b>649.3</b>  |
| 308.1      |                | 1176.4   |               |
| 308.9      | <b>308.2</b>   | 1553.6   | <b>1552.4</b> |
| 310.0      | <b>309.7</b>   | 310.0    | <b>309.7</b>  |
| 314.5      | <b>314.2</b>   | 663.1    | <b>662.4</b>  |

TABLE I. (*Continued.*)

| $E_\gamma$ |                | $E_i$    |               |
|------------|----------------|----------|---------------|
| Original   | New            | Original | New           |
| 332.4      | <b>332.3</b>   | 1718.6   | <b>1717.8</b> |
| 340.0      | <b>339.6</b>   | 650.0    | <b>649.3</b>  |
| 340.5      | <b>340.6</b>   | 718.5    | <b>718.0</b>  |
| 348.6      | <b>348.2</b>   | 348.6    | <b>348.2</b>  |
| 349.8      | <b>349.7</b>   | 857.7    | <b>857.0</b>  |
| 356.2      | <b>356.0</b>   | 881.0    | <b>879.9</b>  |
| 359.8      | <b>359.5</b>   | 1078.3   | <b>1077.5</b> |
| 369.5      | <b>369.0</b>   | 464.4    | <b>463.8</b>  |
| 369.9      | <b>369.8</b>   | 718.5    | <b>718.0</b>  |
| 373.1      | <b>372.3</b>   | 881.0    | <b>879.9</b>  |
| 380.1      | <b>380.0</b>   | 1176.4   | <b>1175.5</b> |
| 390.8      | <b>390.5</b>   | 623.8    | <b>623.0</b>  |
| 393.3      | <b>393.2</b>   | 857.7    | <b>857.0</b>  |
| 399.9      | <b>399.7</b>   | 1365.0   | <b>1363.9</b> |
| 399.9      | <b>(399.6)</b> | 1118.4   | <b>1117.6</b> |
| 413.0      | <b>412.7</b>   | 507.9    | <b>507.3</b>  |
| 415.2      | <b>415.1</b>   | 1078.3   | <b>1077.5</b> |
| 417.0      | <b>416.8</b>   | 650.0    | <b>649.3</b>  |
| 418.3      | <b>418.1</b>   | 796.3    | <b>795.5</b>  |
| 432.3      | <b>432.0</b>   | 1302.8   | <b>1302.2</b> |
| 457.2      | <b>456.9</b>   | 965.1    | <b>964.3</b>  |
| 464.4      | <b>463.9</b>   | 464.4    | <b>463.8</b>  |
| 468.4      | <b>468.3</b>   | 1118.4   | <b>1117.6</b> |
| 470.2      | <b>470.3</b>   | 1534.6   | <b>1534.2</b> |
| 479.7      | <b>479.5</b>   | 857.7    | <b>857.0</b>  |
| 484.0      | <b>483.9</b>   | 1365.0   | <b>1363.9</b> |
| 494.6      | <b>494.6</b>   | 1118.4   | <b>1117.6</b> |
| 498.1      | <b>498.1</b>   | 1800.9   | <b>1800.3</b> |
| 506.0      | <b>505.8</b>   | 1570.4   | <b>1569.6</b> |
| 526.2      | <b>526.2</b>   | 1244.7   | <b>1244.1</b> |
| 528.5      | <b>528.4</b>   | 1386.2   | <b>1385.4</b> |
| 528.8      | <b>528.7</b>   | 1882.2   | <b>1881.4</b> |
| 540.0      | <b>539.9</b>   | 1618.3   | <b>1617.4</b> |
| 552.6      | <b>552.4</b>   | 1176.4   | <b>1175.5</b> |
| 555.1      | <b>554.6</b>   | 650.0    | <b>649.3</b>  |
| 557.1      | <b>557.0</b>   | 1353.4   | <b>1352.6</b> |
| 572.1      | <b>572.1</b>   | 2106.7   | <b>2106.3</b> |
| 578.4      | <b>578.4</b>   | 1881.2   | <b>1880.6</b> |
| 585.2      | <b>585.1</b>   | 1950.2   | <b>1949.0</b> |
| 588.5      | <b>588.2</b>   | 1553.6   | <b>1552.4</b> |
| 589.9      | <b>589.9</b>   | 1386.2   | <b>1385.4</b> |
| 600.2      | <b>600.2</b>   | 1718.6   | <b>1717.8</b> |
| 624.7      | <b>624.6</b>   | 857.7    | <b>857.0</b>  |
| 632.7      | <b>633.3</b>   | 1877.4   | <b>1877.4</b> |
| 637.5      | <b>637.5</b>   | 870.5    | <b>870.1</b>  |
| 642.8      | <b>643.1</b>   | 2213.2   | <b>2212.6</b> |
| 647.1      | <b>646.3</b>   | 2448.0   | <b>2446.6</b> |
| 651.3      | <b>651.2</b>   | 2037.5   | <b>2036.6</b> |
| 658.8      | <b>658.7</b>   | 2277.1   | <b>2276.1</b> |
| 664.1      | <b>664.1</b>   | 1534.6   | <b>1534.2</b> |
| 677.2      | <b>676.9</b>   | 2230.8   | <b>2229.3</b> |
| 679.0      | <b>679.2</b>   | 1302.8   | <b>1302.2</b> |
| 680.6      | <b>680.4</b>   | 2728.0   | <b>2727.3</b> |
| 686.4      | <b>686.4</b>   | 1064.4   | <b>1063.8</b> |
| 694.0      | <b>694.0</b>   | 2047.4   | <b>2046.7</b> |
| 696.8      | <b>688.6</b>   | 3424.8   | <b>3415.9</b> |

TABLE I. (*Continued.*)

| $E_\gamma$ |                | $E_i$    |                 |
|------------|----------------|----------|-----------------|
| Original   | New            | Original | New             |
| 704.8      | <b>705.3</b>   | 1881.2   | <b>1880.6</b>   |
| 705.8      | <b>706.0</b>   | 1882.2   | <b>1881.4</b>   |
| 707.3      | <b>707.3</b>   | 2589.5   | <b>2588.9</b>   |
| 708.2      | <b>708.0</b>   | 2426.8   | <b>2425.8</b>   |
| 708.3      | <b>708.4</b>   | 2589.5   | <b>2588.9</b>   |
| 736.5      | <b>736.6</b>   | 1800.9   | <b>1800.3</b>   |
| 756.0      | <b>755.9</b>   | 2793.5   | <b>2792.5</b>   |
| 762.4      | <b>762.4</b>   | 1386.2   | <b>1385.4</b>   |
| 763.4      | <b>763.0</b>   | 2640.8   | <b>3328.8</b>   |
|            | <b>688.4</b>   |          | <b>2565.8</b>   |
| 769.4      | <b>768.9</b>   | 2982.6   | <b>2981.5</b>   |
| 774.1      | <b>774.2</b>   | 1570.4   | <b>1569.6</b>   |
| 775.6      | <b>775.4</b>   | 870.5    | <b>870.1</b>    |
| 778.3      | <b>778.1</b>   | 3205.1   | <b>3203.9</b>   |
| 825.8      | <b>825.7</b>   | 2873.2   | <b>2872.4</b>   |
| 831.4      | <b>831.2</b>   | 1064.4   | <b>1063.8</b>   |
| 835.3      | <b>827.0</b>   | 3424.8   | <b>3415.9</b>   |
| 841.5      | <b>841.2</b>   | 3635.0   | <b>3633.7</b>   |
| 845.8      | <b>846.1</b>   | 2728.0   | <b>2727.3</b>   |
| 859.8      | <b>859.9</b>   | 2213.2   | <b>2212.6</b>   |
| 922.3      | <b>922.3</b>   | 1718.6   | <b>1717.8</b>   |
| 924.8      | <b>925.0</b>   | 1204.8   | <b>1302.2</b>   |
| 935.2      | <b>(934.8)</b> | 2982.6   | <b>2981.5</b>   |
| 946.6      | <b>946.7</b>   | 1570.4   | <b>1569.6</b>   |
| 950.5      | <b>(950.1)</b> | 3823.7   | <b>3822.5</b>   |
|            | <b>(937.8)</b> |          | <b>(3810.2)</b> |
| 964.3      | <b>975.0</b>   | 3692.3   | <b>3702.3</b>   |
| 1084.9     | <b>1085.0</b>  | 1881.2   | <b>1880.6</b>   |

preconceived beliefs and it has the danger of introducing incorrect transition and level energies into the literature. The main purpose of this erratum is to provide the original data.

Everywhere in the text where our original paper specified transition or level energies, these should now be replaced by the corresponding ones in Table I. The new level scheme of  $^{105}\text{Mo}$  is shown in Figs. 1–3 of this erratum.

Other corrections of the original paper are also listed below.

In Table I of the original paper, the 308.1 keV transition is a misprint of the 380.1 keV one. There was no such transition in the level scheme in Fig. 1 of the original paper. In the same Table I of the original paper, in row 314.5, the spin and parity of the 348.0 keV populating level were listed as  $(5/2^-)$ . The correct value is  $(5/2^+)$ . Similarly, in row 399.9, the spin and parity of the 1365.0 keV depopulating level were listed as  $(31/2^+)$ . The correct value is  $(13/2^+)$ . In the same table, the initial level energy of the 924.8 keV transition was listed as 1204.8 keV. This level is a misprint of the 1302.8 keV level. There was no such level in the level scheme.

There are changes to the transitions and level scheme of  $^{105}\text{Mo}$  in this erratum. The 145.2, 399.9 (in Fig. 3 of this erratum, depopulating the 1117.6 keV level) and 935.2 keV transitions reported in the original paper have been identified as tentative in this erratum. In the original paper, a 950.5 keV transition was reported as depopulating the  $31/2^-$  level in band (1). In this erratum, this transition is reassigned as tentative 950.1 keV. Another tentative 937.8 keV transition is also identified to populate the same  $27/2^-$  level in band (1). The two tentative 937.8 and 950.1 keV transitions are both possible to be the  $31/2^-$  state of band (1). Thus, there is ambiguous assignments of the  $31/2^-$  level of band (1) and no spin/parity assignments are labeled of the tentative 3822.5 keV level in Fig. 1 of this erratum. The 964.3 keV transition in the original paper populating the  $25/2^-$  level in band (1) is replaced by a new 975.0 keV transition. The 835.3 and 696.8 keV transitions in the original paper depopulating the  $25/2^-$  state of band (2) are incorrect. Instead, the two new 827.0 and 688.6 keV transitions are identified to depopulate the  $25/2^-$  state. This  $25/2^-$  state changes from 3424.8 keV in the original paper to 3415.9 keV in this erratum. In the original paper, a 763.4 keV transition was reported to populate the  $17/2^+$  state of band (2). In this erratum, a new 688.4 keV transition is identified to populate the same state. The original 763 keV transition lies on top of the new 688 keV transition and provides evidence for a new  $25/2^+$  state. The comparison showing the newly identified levels and transitions is shown in Fig. 4.

Since bands (1), (2), and (5) levels have been changed in this erratum, Figs. 7–11 of the signature splitting, angular momentum alignment  $I_x$ ,  $J_1$  moments of inertia, and excitation energies comparison in the original paper would also change according to

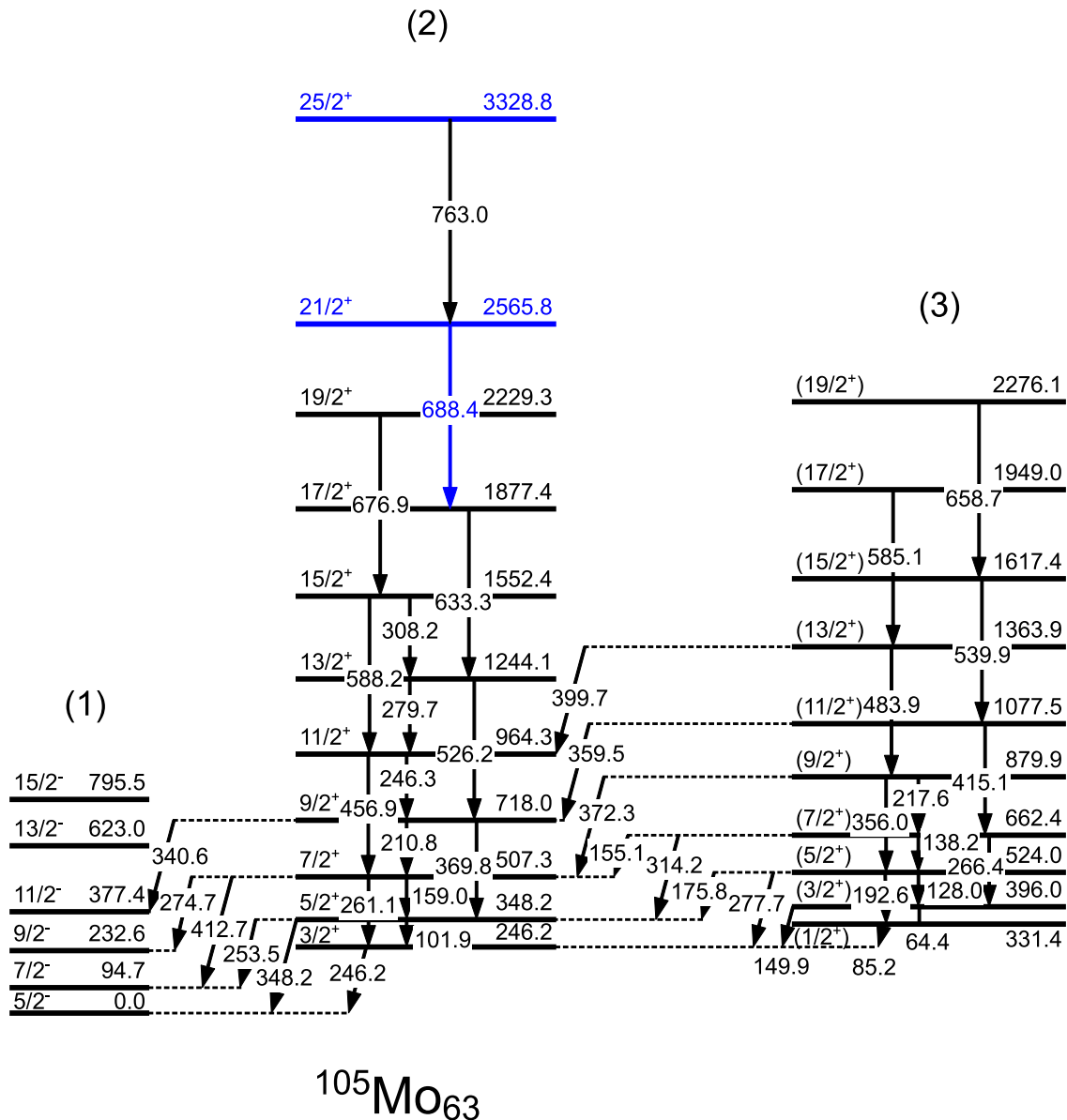


FIG. 2. Partial level scheme showing levels and transitions in  $^{105}\text{Mo}$ . New identified transition and levels labeled in blue.

the energy corrections. In bands (1) and (5), the new transitions of 975 and 827 keV have relatively small change to the original values of 964 and 835 keV. Thus, the parts related to those two bands would change slightly after energy correction and do not change the final conclusion. In Fig. 7 of the original paper, there were ambiguous assignments of the  $23/2^-$  levels in  $^{103}\text{Zr}$  [1,2]. In the original paper, data from Ref. [1] were taken and were confirmed to be correct in this erratum. In Fig. 10 of the original paper, new levels of the two  $\gamma$  bands in  $^{104}\text{Mo}$  in Ref. [3] would change the figure slightly.

In Fig. 8(a) of the original paper, angular momentum alignment  $I_x$  of bands in  $^{104,105}\text{Mo}$  was compared. With the new energy levels of the  $3/2^+$  band (2), values would show a little upbending at high spin. However, the compared  $3/2^+$ ,  $5/2^+$ , and  $1/2^+$  bands in  $^{105}\text{Mo}$  and the yrast band in  $^{104}\text{Mo}$  would still show similarities.

In Fig. 9 of the original paper,  $J_1$  moments of inertia of the positive parity bands in  $^{105,107}\text{Mo}$  were compared. The new levels in the  $3/2^+$  band in  $^{105}\text{Mo}$  would add two more data points and show a little upbending at the end of high spin. In contrast, the original figure showed a straight line from the beginning to the end.

The authors thank the Phys. Rev. C editors and the data scientists at the National Nuclear Data Center at BNL for calling our attention to these corrections.

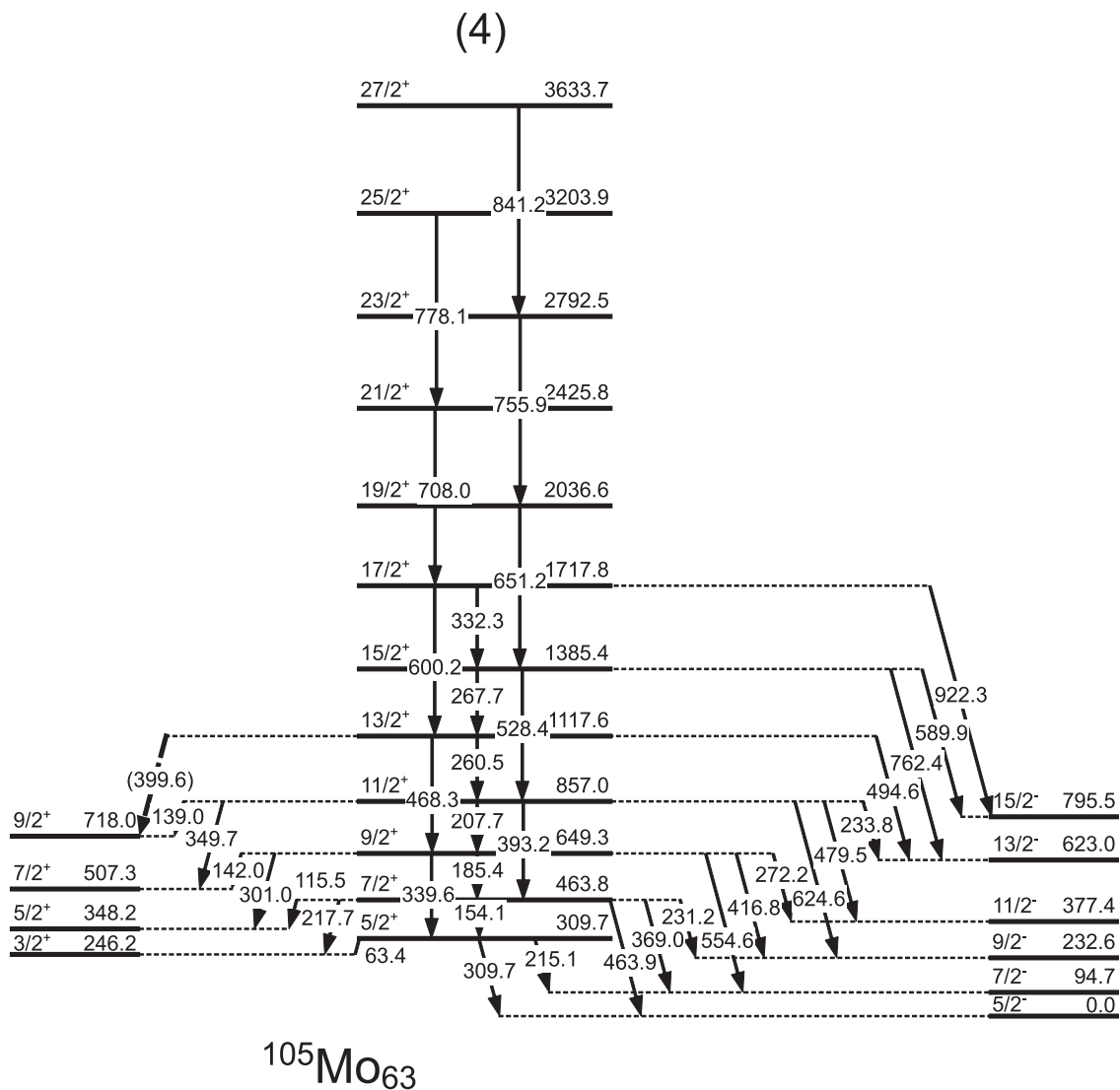


FIG. 3. Partial level scheme showing levels and transitions in  $^{105}\text{Mo}$ . Tentative transitions are labeled with parentheses. Note that the 399.6 keV transition is reassigned as tentative in this erratum rather than firmly assigned as in the original paper.

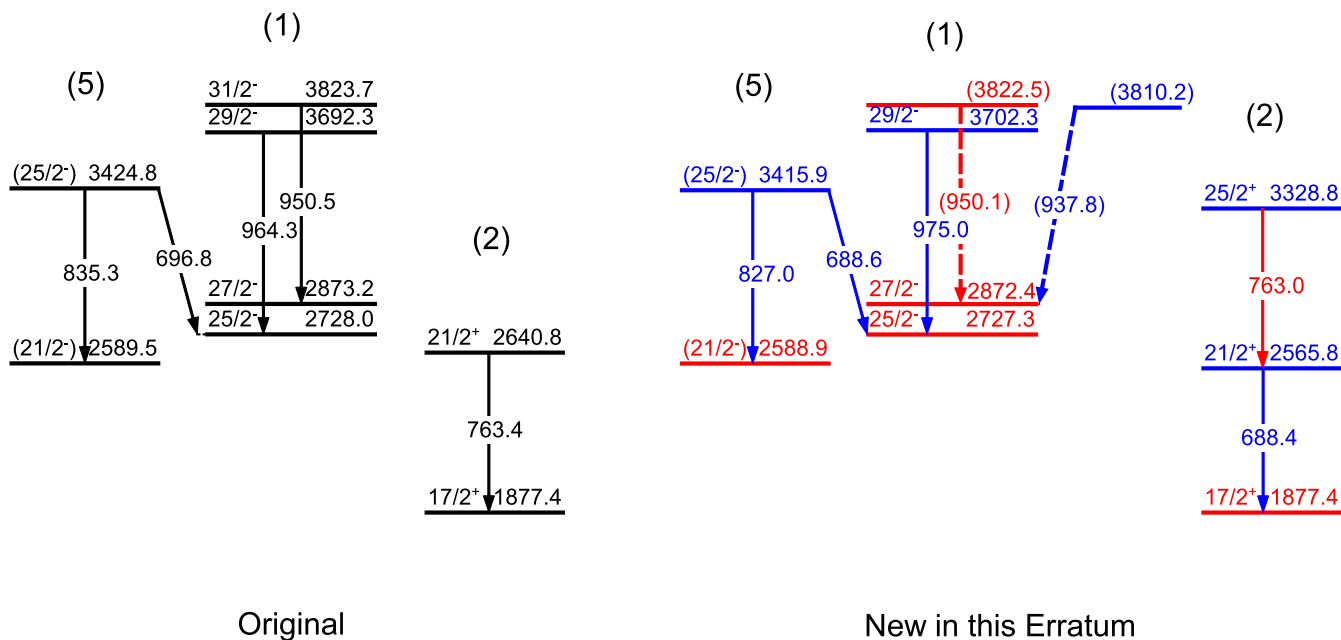


FIG. 4. Partial level scheme showing newly identified levels and transitions in  $^{105}\text{Mo}$  compared to the level scheme in the original paper. On the right side, the previously identified levels and transitions are labeled in red, while the new identified levels and transitions are labeled in blue.

- [1] H. Hua *et al.*, *Phys. Rev. C* **69**, 014317 (2004).  
 [2] W. Urban *et al.*, *Phys. Rev. C* **79**, 067301 (2009).  
 [3] B. M. Musangu *et al.*, *Phys. Rev. C* **104**, 064318 (2021).