Erratum: Identification of new transitions and mass assignments of levels in $^{143–153}$Pr [Phys. Rev. C 92, 034317 (2015)]

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We report several corrections to the initial publication.

In our original publication of level schemes for isotopes ^{147,149,151,152,153}Pr, we determined level energies based on certain transitions and subsequently adjusted the raw data for other transitions to fit these energies. Transitions with energies less than 30 keV in ^{147}Pr were deduced from the energy difference were not observed directly because they were not observed in our data. This is not correct scientific procedure as it alters original data to match preconceived beliefs and it has the danger of introducing incorrect transition and level energies into the literature, in particular when future research might associate transition energies determined from the present experiment with actual transitions in this nucleus or in other nuclei. The main purpose of this erratum is to provide the original data in the correct form.

In this erratum, revised level schemes of $^{147–153}$Pr are illustrated in Figs. 1–7, accompanied by their corresponding transition energies listed in Tables I–VII, respectively. A recalibration of energy was applied, resulting in many numerical adjustments.

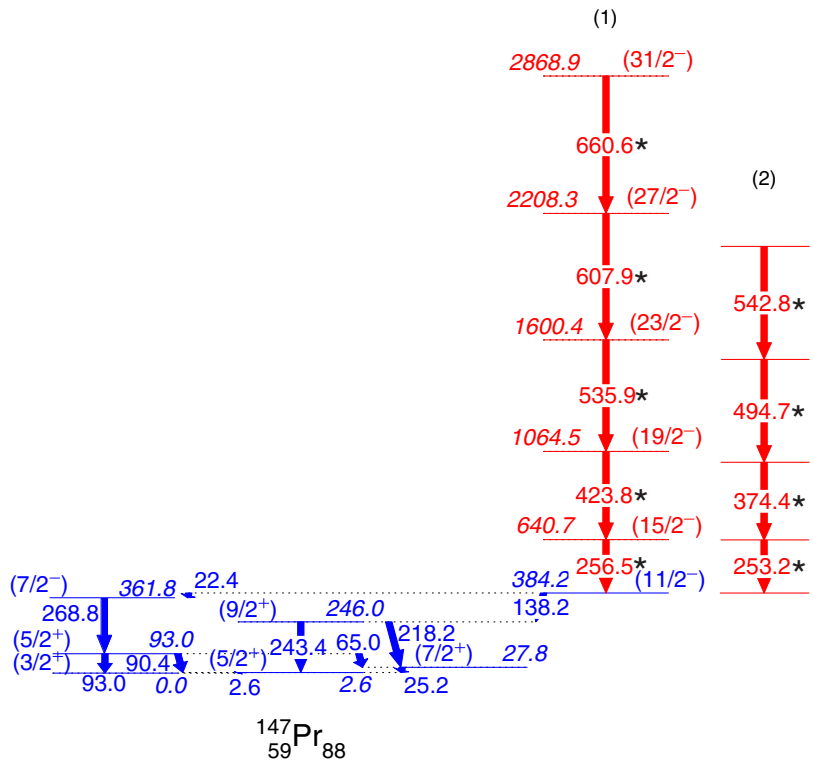

FIG. 1. Level scheme of ^{147}Pr. Previously reported transitions and levels in β-decay work are denoted in blue. Those in red indicate new levels and transitions identified in the original paper but not this erratum. Energies are given in keV. The 2.6, 22.4, and 25.2 keV transitions are not observed directly. Therefore, their energies are derived from the energy differences of other transitions.

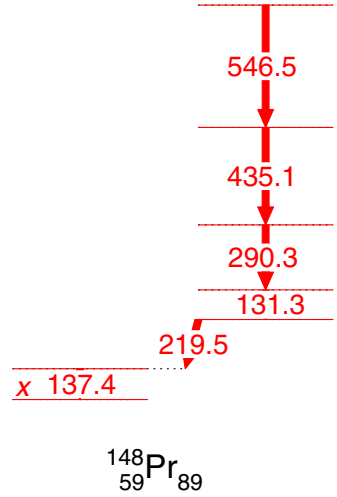

FIG. 2. Level scheme of ^{148}Pr. Energies are given in keV.

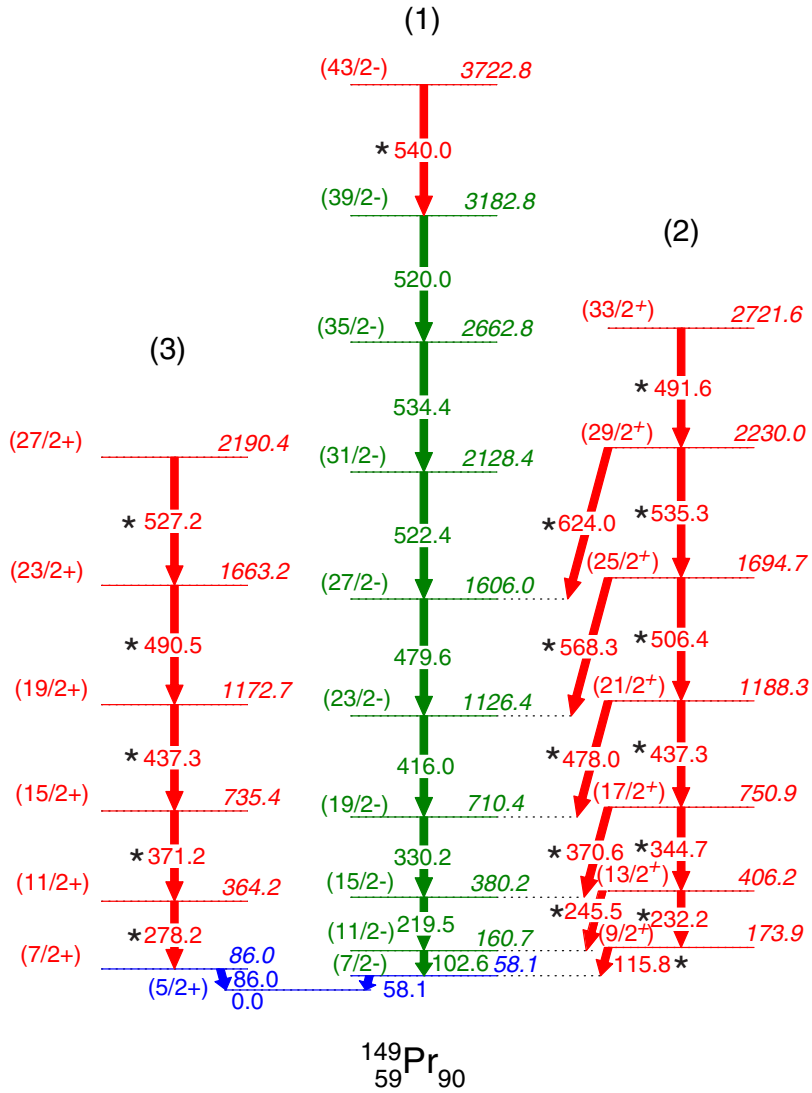

FIG. 3. Level scheme of ^{149}Pr. Transitions and levels previously reported in β-decay work are denoted in blue, while those reported by Ref. [4] of the original paper are labeled in green. Those in red indicate new levels and transitions identified in the original paper but not this erratum. Energies are given in keV.

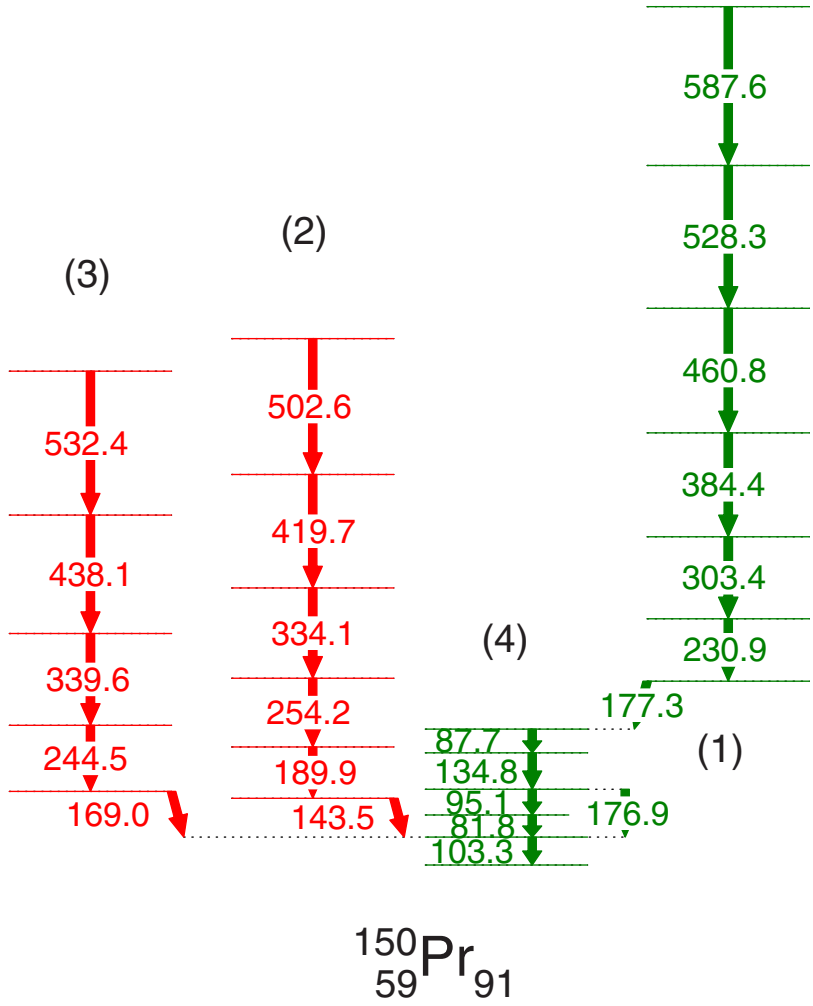

FIG. 4. Level scheme of ^{150}Pr. Transitions and levels previously reported by Refs. [4,5] of the original paper are denoted in green. Those in red indicate new levels and transitions identified in the original paper but not this erratum. Energies are given in keV.

Everywhere in the text where our original paper specified transition or level energies, these should now be replaced by the corresponding new ones in the tables in this erratum.

Additional corrections to the original paper are also listed below.

The level scheme of ^{150}Pr has been changed in this erratum. The 103 keV transition is relocated at the very bottom of the level scheme. Furthermore, modifications are made to the band head of bands 2 and 3, proposing directly population of the 103 keV level. The 82 and 95 keV transitions are also reversed based on evidence suggesting a ns scale lifetime of the 103 keV transition, whereas evidence for a ns scale lifetime for the 82 keV transition is weak. However, these lifetimes required further investigation due to the low intensity and potential contaminations of γ rays. More work is needed to confirm the order of the low lying transitions.

In the original paper, band 3 of ^{152}Pr was proposed to be built on the 114.8 keV 4.1 μs isomer. This assignment was made in consideration of the 98 keV transition reported in β decay. However, a recent IT decay experiment [1] has reported a 98.1 keV transition populating the ground state. Consequently, band 3 could decay to the ground state or the 114.8 keV isomer. Further investigation is needed to confirm this segment of the level scheme.

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

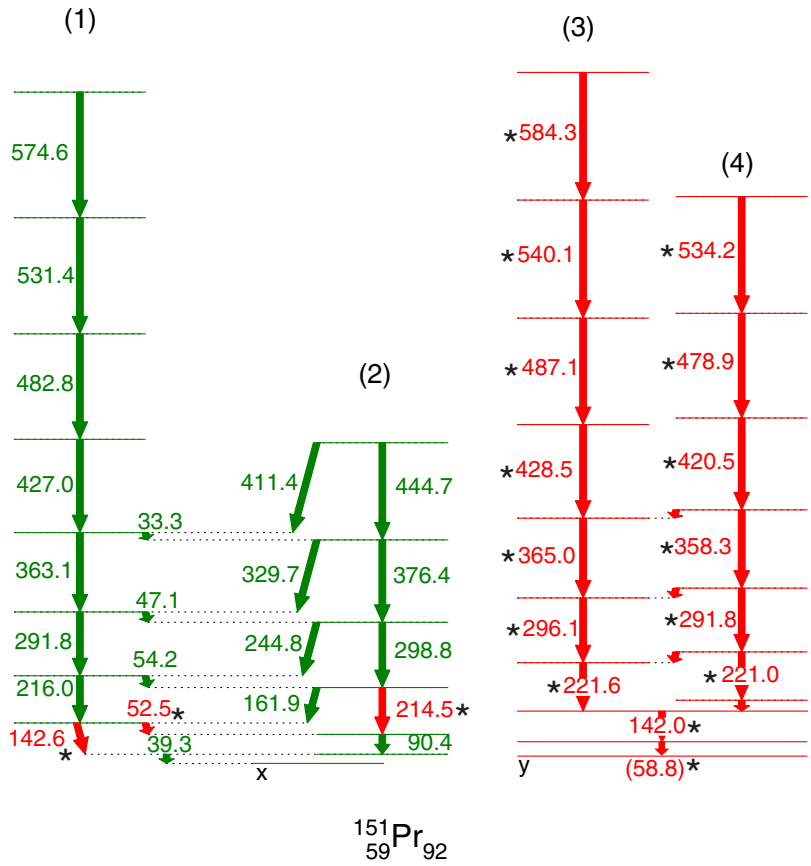

FIG. 5. Level scheme of ^{151}Pr. Transitions and levels previously reported by Ref. [5] of the original paper are denoted in green. Those in red indicate new levels and transitions identified in the original paper but not this erratum. Energies are given in keV. The 33.3 keV transition is not observed directly but can be identified through the coincidence. The energy of this transition is deduced from the energy gap of other transitions.

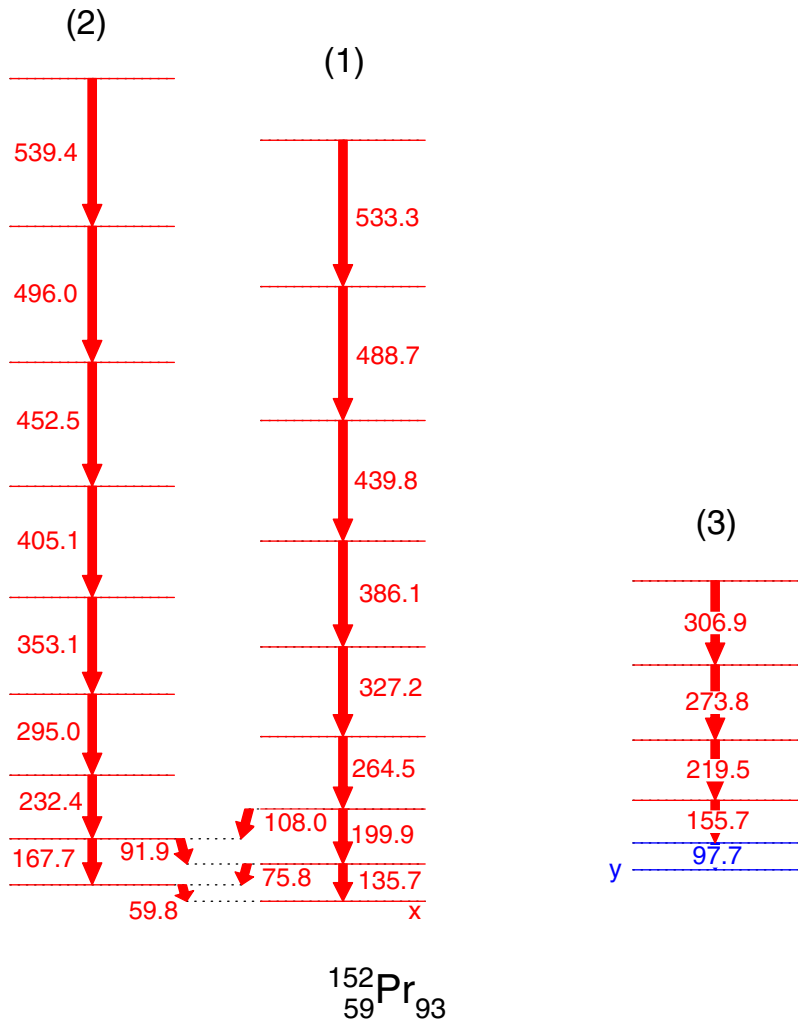

FIG. 6. Level scheme of ^{152}Pr. Transitions and levels previously reported in β-decay work are denoted in blue. Those in red indicate new levels and transitions identified in the original paper but not this erratum. Energies are given in keV.

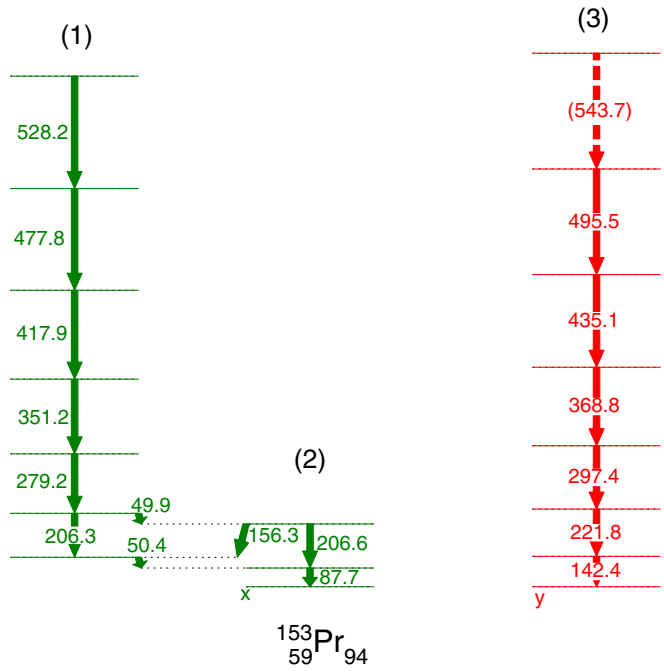

FIG. 7. Level scheme of ^{153}Pr. Transitions and levels previously reported by Ref. [5] of the original paper are denoted in green. Those in red indicate new levels and transitions identified in the original paper but not this erratum. Energies are given in keV.

TABLE I. List of the γ-ray transition energies in keV in ^{147}Pr. The old energy values from the original paper are provided for comparison. Note that the 2.7, 22.8, and 25.2 keV transitions are not directly observed and deduced from energy difference. The 25.2 one is deduced from the energy difference of the 243.4 and 218.2 keV transitions. The energy difference of 90.4 and 65.0 keV transitions is not considered due to the weak nature of the 65.0 keV transition, and possible influence by the 66 keV neutron scatter contamination.

E_γ (keV)		E_i (keV)	
Original	New	Original	New
2.7	**2.6**	2.7	**2.6**
22.8	**22.4**	385.1	**384.3**
25.2	**25.2**	27.9	**27.8**
65.3	**65.0**	93.2	**93.0**
90.5	**90.4**	93.2	**93.0**
93.2	**93.0**	93.2	**93.0**
138.7	**138.2**	385.1	**384.2**
218.5	**218.2**	246.4	**246.0**
243.7	**243.4**	246.4	**246.0**
253.5	**253.2**		
256.6	**256.5**	641.7	**640.7**
269.1	**268.8**	362.3	**361.8**
374.6	**374.4**		
423.9	**423.8**	1065.6	**1064.5**
494.8	**494.7**		
536.1	**535.9**	1601.7	**1600.4**
542.6	**542.8**		
607.9	**607.9**	2209.6	**2208.3**
660.5	**660.6**	2870.1	**2868.9**

TABLE II. List of the γ-ray transition energies in keV in ^{148}Pr. The old energy values from the original paper are also listed for comparison.

E_γ (keV)	
Original	New
132.1	**131.3**
137.6	**137.4**
219.9	**219.5**
290.5	**290.3**
435.2	**435.1**
546.4	**546.5**

TABLE III. List of the γ-ray transition energies in keV in ^{149}Pr. The old energy values from the original paper are also listed for comparison.

E_γ (keV)		E_i (keV)	
Original	New	Original	New
58.5	**58.1**	58.5	**58.1**
86.5	**86.0**	86.5	**86.0**
103.2	**102.6**	161.7	**160.7**
116.4	**115.8**	174.9	**173.9**
219.8	**219.5**	381.5	**380.2**
232.4	**232.2**	407.3	**406.2**
245.6	**245.5**	407.3	**406.2**
278.5	**278.2**	365.0	**364.2**
330.3	**330.2**	711.8	**710.4**
344.7	**344.7**	752.0	**750.9**
370.5	**370.6**	752.0	**750.9**
371.6	**371.2**	736.6	**735.4**
416.0	**416.0**	1127.8	**1126.4**
437.4	**437.3**	1174.0	**1172.7**
437.4	**437.3**	1189.4	**1188.3**
477.6	**478.0**	1189.4	**1188.3**
479.8	**479.6**	1608.6	**1606.0**
490.7	**490.5**	1664.7	**1663.2**
491.7	**491.6**	2723.0	**2721.6**
506.4	**506.4**	1695.8	**1694.7**
520.3	**520.0**	3185.9	**3182.8**
522.5	**522.4**	2131.1	**2128.4**
527.3	**527.2**	2192.0	**2190.4**
534.5	**534.4**	2665.6	**2662.8**
535.5	**535.3**	2231.3	**2230.0**
538.9	**540.0**	3724.8	**3722.8**
568.0	**568.3**	1695.8	**1694.7**
622.7	**624.0**	2231.3	**2230.0**

TABLE IV. List of the γ-ray transition energies in keV in ^{150}Pr. The old energy values from the original paper are also listed for comparison.

E_γ (keV)	
Original	New
82.2	**81.8**
87.9	**87.9**
96.0	**95.1**
104.0	**103.3**
135.3	**134.8**
(143.7)	**143.5**
168.9	**169.0**
177.9	**177.3**
190.2	**189.9**
(223.2)	
231.2	**230.9**
244.7	**244.5**
254.6	**254.2**
303.7	**303.4**
334.3	**334.1**
340.0	**339.6**
384.3	**384.4**
419.8	**419.7**
438.4	**438.1**
460.9	**460.8**
503.0	**502.6**
528.5	**528.3**
532.6	**532.4**
587.2	**587.6**

TABLE V. List of the γ-ray transition energies in keV in ^{151}Pr. The old energy values from the original paper are also listed for comparison.

E_γ (keV)	
Original	New
33.3	**33.3**
39.4	**39.3**
47.2	**47.1**
52.3	**52.5**
54.0	**54.2**
(59.2)	**(58.8)**
90.8	**90.4**
142.3	**142.0**
(143.1)	**142.6**
162.3	**161.9**
214.6	**214.5**
216.3	**216.0**
221.3	**221.0**
221.9	**221.6**
244.8	**244.8**
291.9	**291.8**
292.0	**291.8**
296.4	**296.1**
298.8	**298.8**
330.0	**329.7**
358.4	**358.3**
363.3	**363.1**
365.2	**365.0**
377.2	**376.4**
411.7	**411.4**
420.8	**420.5**
427.1	**427.0**
428.7	**428.5**
445.0	**444.7**
479.1	**478.9**
483.1	**482.8**
487.3	**487.1**
531.6	**531.4**
534.6	**534.2**
540.5	**540.1**
575.0	**574.6**
584.4	**584.3**

TABLE VI. List of the γ-ray transition energies in keV in ^{152}Pr. The old energy values from the original paper are also listed for comparison.

E_γ (keV)	
Original	New
60.0	**59.8**
76.0	**75.8**
92.0	**91.9**
98.1	**97.7**
108.4	**108.0**
114.8	
136.0	**135.7**
155.5	**155.7**
168.0	**167.7**
200.4	**199.9**
219.6	**219.5**
232.6	**232.4**
264.5	**264.5**
274.1	**273.8**
295.3	**295.0**
306.9	**306.9**
327.3	**327.2**
353.4	**353.1**
386.1	**386.1**
405.4	**405.1**
440.1	**439.8**
452.4	**452.5**
488.7	**488.7**
496.2	**496.0**
534.0	**533.3**
539.5	**539.4**

TABLE VII. List of the γ-ray transition energies in keV in ^{153}Pr. The old energy values from the original paper are also listed for comparison.

E_γ (keV)	
Original	New
49.9	**49.9**
50.4	**50.4**
88.0	**87.7**
143.0	**142.4**
156.7	**156.3**
206.6	**206.3**
207.1	**206.6**
221.9	**221.8**
279.5	**279.2**
297.7	**297.4**
351.1	**351.2**
368.9	**368.8**
417.8	**417.9**
435.6	**435.1**
477.9	**477.8**
496.2	**495.5**
528.4	**528.2**
(544.0)	**(543.7)**

[1] P. Alexa *et al.*, Phys. Rev. C **97**, 034327 (2018).