Erratum: Level structure of ^{141}Ba and ^{139}Xe and the level systematics of $N = 85$ even-odd isotones [Phys. Rev. C 66, 014305 (2002)]

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In this Erratum to our publication, we report the corrections to the previous paper of ^{141}Ba and ^{139}Xe.

In our original publication in Figs. 1 and 2 of level schemes, we defined level energies based on certain transitions and then adjusted the raw data for other transitions to fit those energies. The energies were given in Tables I and II of the original paper. This is not the 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. 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 and II. The new level scheme of ^{141}Ba and ^{139}Xe are shown in Figs. 3 and 4. The level scheme, γ-ray coincidences and energies were checked two decades after the original publication based on the authors' best efforts to recover the relevant data. Furthermore, beyond the correction of the reported energies, the reexamination of the spectroscopic data from the original publication also changed the last transitions and levels of bands (1)–(3) of the ^{139}Xe level scheme. In detail, the transition and level energies have been updated for the following additional reasons:

(1) In the Tables I and II of the original paper, transition energies of ^{141}Ba and ^{139}Xe were given with two decimals, respectively. This is not suitable because the fitting errors were always, at least, an order of magnitude smaller than the systematic standard deviation (0.1 keV).

(2) The ^{141}Ba transitions have been updated in this Erratum. The 346.3 and 517.1 keV transitions were listed as tentative previously. In this Erratum, these two transitions are firmly assigned. The 395.3-keV transition assigned in the original paper is reassigned as tentative in this Erratum. This tentative transition lies on the high-energy side of the strong 393-keV Mo fission partner peak. The 835.4-keV transition in the original paper has been remeasured as 836.6 in this Erratum.

(3) The ^{139}Xe γ-ray transitions have also been updated in this Erratum. In the original paper, the transition energies for the two γ-ray doublets at ≈ 491 keV and ≈ 526 keV were incorrectly reported. After reanalysis, the transition energies for the doublet at ≈ 491 keV are 491.0 and 492.1 keV (thereby correcting the energies reported in the original paper as 491.8 and 490.9 keV, respectively; note the inverted energy order). The corrected transition energies for the doublet at ≈ 526 keV are 526.9 and 527.8 keV (replacing the incorrect values of 525.2 and 527.9 keV, respectively, reported in the original paper). In this Erratum we cannot confirm the tentative 619.6-keV transition reported in the original paper as populating the $(29/2+)$ state in band (3). (We note that there is a strong 619-keV transition from the Ru fission partner.) The tentative 962-keV transition populating the $(31/2^-)$ state in band (1) reported in the original paper is replaced by a 888.1-keV transition in this Erratum. The tentative 995-keV transition populating the $(37/2^-)$ state in band (2) reported in the original paper is replaced by a 552.0-keV transition in this Erratum. Another 269.9-keV transition is also identified to populate the same $(37/2^-)$ state. However, this transition is weaker than the 552.0-keV one so it is not placed in band (2).

Other typographical errors are also listed in this Erratum. They are corrections related to the figures.

(1) In Fig. 5 of the original paper, the $25/2^+$ levels of ^{139}Xe and ^{147}Gd were not labeled at the correct energies. The neutron symbol was not labeled with the correct greek letter. On the right part of the figure in the original paper, the final level of ^{139}Xe was labeled as $31/2^-$. The correct spin/parity should be $33/2^-$. The new figure is shown in Fig. 5 in this Erratum.

(2) In Fig. 6 of the original paper, the ^{140}Ba levels were labeled with $s = +i$. The correct simplex number is $s = +1$. The $(13/2^+)$, $(17/2^+)$, and $(21/2^+)$ levels in ^{141}Ba were not labeled at the correct energies. The new figure is shown in Fig. 6 in this Erratum.

(3) In Fig. 8 of the original paper, the $5/2^-$ level (proposed at 48.5 keV) in ^{141}Ba was labeled above the $7/2^-$ level (proposed at 55.0 keV). The energy sequence of these two levels was reversed. In the same figure, the $5/2^-$ and $7/2^-$ levels in ^{139}Xe were normalized to the $7/2^-$ level. The $5/2^-$ and

TABLE I. List of the γ-ray transition energies in keV in ^{141}Ba. Tentative transitions and levels are listed with parentheses. The old energy values from Fig. 1 of the original paper are also listed for comparison.

E_γ		E_i	
Original	Newly corrected	Original	Newly corrected
214.3	**214.2**	2329.1	**2329.3**
231.3	**231.4**	3175.1	**3175.4**
261.1	**261.1**	2433.3	**2433.3**
278.7	**278.8**	2114.9	**2115.0**
318.1	**318.1**	3493.2	**3493.5**
318.3	**318.3**	2433.3	**2433.3**
335.8	**335.6**	4244.2	**4244.4**
335.9	**336.0**	2172.2	**2172.2**
(346.3)	**345.9**	3127.8	**3127.7**
348.2	**348.4**	2781.5	**2781.6**
395.3	**(395.3)**	2114.9	**2115.0**
415.2	**415.2**	3908.5	**3908.7**
417.6	**417.6**	1719.6	**1719.7**
452.3	**452.2**	2781.5	**2781.6**
452.5	**452.5**	2172.2	**2172.2**
495.1	**495.2**	1836.2	**1836.3**
(517.1)	**518.3**	2950.4	**2951.6**
532.3	**532.3**	1719.6	**1719.7**
534.2	**534.2**	1836.2	**1836.3**
543.7	**543.7**	1187.3	**1187.4**
549.4	**549.4**	3493.2	**3493.5**
555.1	**555.1**	610.1	**610.1**
561.6	**561.1**	610.1	**610.1**
577.2	**577.3**	1187.3	**1187.4**
588.6	**588.6**	643.6	**643.6**
597.0	**597.0**	2433.3	**2433.3**
609.3	**609.3**	2781.5	**2781.6**
609.5	**609.5**	2329.1	**2329.3**
614.7	**614.7**	2943.8	**2944.0**
658.4	**658.4**	1302.0	**1302.0**
687.4	**687.4**	4931.7	**4931.8**
690.7	**690.7**	3472.2	**3472.3**
694.5	**694.5**	3127.8	**3127.7**
697.5	**697.5**	1341.1	**1341.1**
706.4	**706.4**	3834.2	**3834.1**
733.3	**733.3**	3908.5	**3908.7**
751.0	**751.0**	4244.2	**4244.4**
784.4	**784.4**	4618.6	**4618.5**
812.9	**812.9**	2114.9	**2115.0**
831.5	**831.5**	4303.7	**4303.8**
835.4	**836.6**	2950.4	**2951.6**
846.0	**846.0**	3175.1	**3175.4**
(869.8)	**(869.8)**	(3820.2)	**(3821.4)**
870.1	**870.1**	2172.2	**2172.2**

TABLE II. List of the γ-ray transition energies in keV in ^{139}Xe. Tentative transitions and levels are labeled with parentheses. The old energy values from Fig. 2 of the original paper are also listed for comparison.

E_γ		E_i	
Original	Newly corrected	Original	Newly corrected
232.9	**232.8**	1809.6	**1809.5**
341.3	**341.3**	2499.8	**2499.7**
348.8	**349.0**	2158.5	**2158.4**
382.7	**382.7**	2192.3	**2192.4**
397.5	**397.5**	1576.7	**1576.5**
425.2	**425.1**	2925.1	**2925.1**
490.9	**492.1**	1084.9	**1086.3**
491.8	**491.0**	1576.7	**1576.5**
501.9	**502.0**	2014.4	**2014.4**
525.2	**526.9**	1084.9	**1086.3**
527.9	**527.8**	559.7	**559.6**
536.9	**536.9**	559.7	**559.6**
560.3	**560.3**	2574.6	**2574.6**
571.1	**571.1**	593.9	**593.9**
580.9	**580.9**	3792.2	**3792.1**
581.7	**581.7**	2158.5	**2158.4**
585.3	**585.3**	1179.2	**1179.2**
(619.6)		(4411.8)	
626.5	**626.5**	3548.0	**3547.9**
630.4	**630.4**	1809.6	**1809.5**
636.6	**636.7**	3211.2	**3211.2**
646.5	**646.5**	4232.2	**4232.1**
661.5	**661.5**	3161.4	**3161.2**
664.2	**664.2**	3585.7	**3585.6**
682.3	**682.3**	3607.4	**3607.4**
690.2	**690.2**	2499.8	**2499.7**
711.4	**711.3**	3211.2	**3211.2**
732.7	**732.7**	2925.1	**2925.1**
763.0	**763.0**	2921.5	**2921.4**
765.0	**765.0**	2574.6	**2574.6**
805.0	**805.0**	3304.9	**3304.7**
835.1	**835.1**	2014.4	**2014.4**
861.5	**861.5**	4022.9	**4022.7**
863.9	**863.9**	5096.1	**5096.0**
918.5	**918.5**	1512.4	**1512.4**
(962)	**888.1**	(4985)	**4910.8**
(995)	**552.0**	(6091)	**5648.0**
1013.1	**1013.4**	2192.3	**2192.4**
1115.4	**1115.7**	2925.1	**2925.1**

the correct greek letter in this figure. In this Erratum, the correct figure is given in Fig. 8.

(4) In Fig. 9 of the original paper, the levels labeled with 13/2$^-$, 17/2$^-$, 21/2$^-$, 25/2$^-$, and 29/2$^-$ spin/parity in ^{139}Xe were not correct. To get the correct spins of the levels, one should increment the old ones by 2, such as 17/2$^-$, 21/2$^-$ etc.,…. The $\approx$1085-keV 13/2$^-$ level was missing in the figure in the original paper. The 21/2$^-$, 25/2$^-$, 29/2$^-$, and 33/2$^-$ levels in ^{139}Xe (labeled from 17/2$^-$ to 29/2$^-$ in the original paper) were not labeled

7/2$^-$levels ^{141}Ba were normalized to the 5/2$^-$ level. Some of the other levels of ^{139}Xe and ^{141}Ba in Fig. 8 of the original paper were not normalized and were labeled at the original excitation energies. The neutron symbol was not labeled with
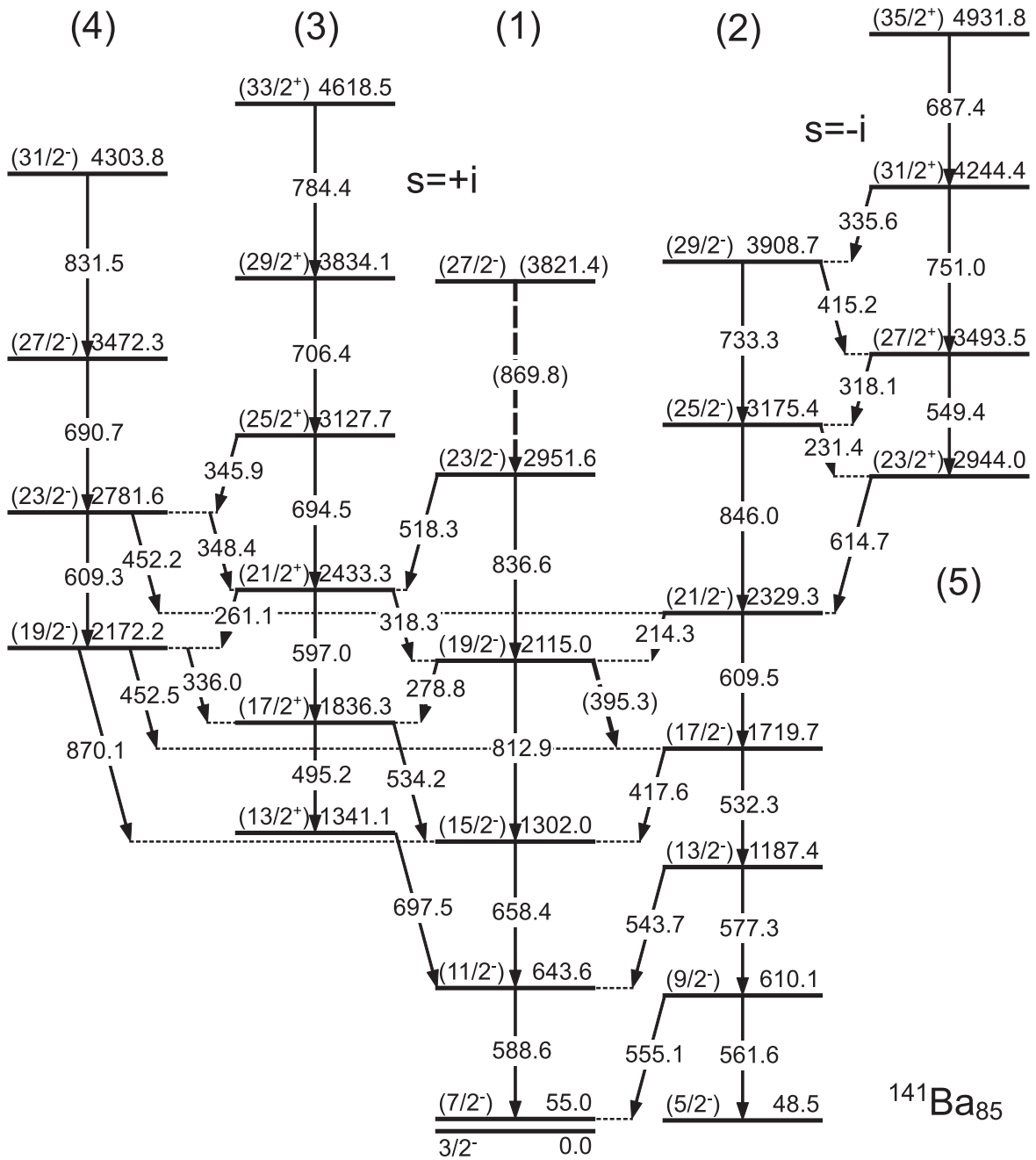
FIG. 3. Level scheme showing levels and transitions in ^{141}Ba.
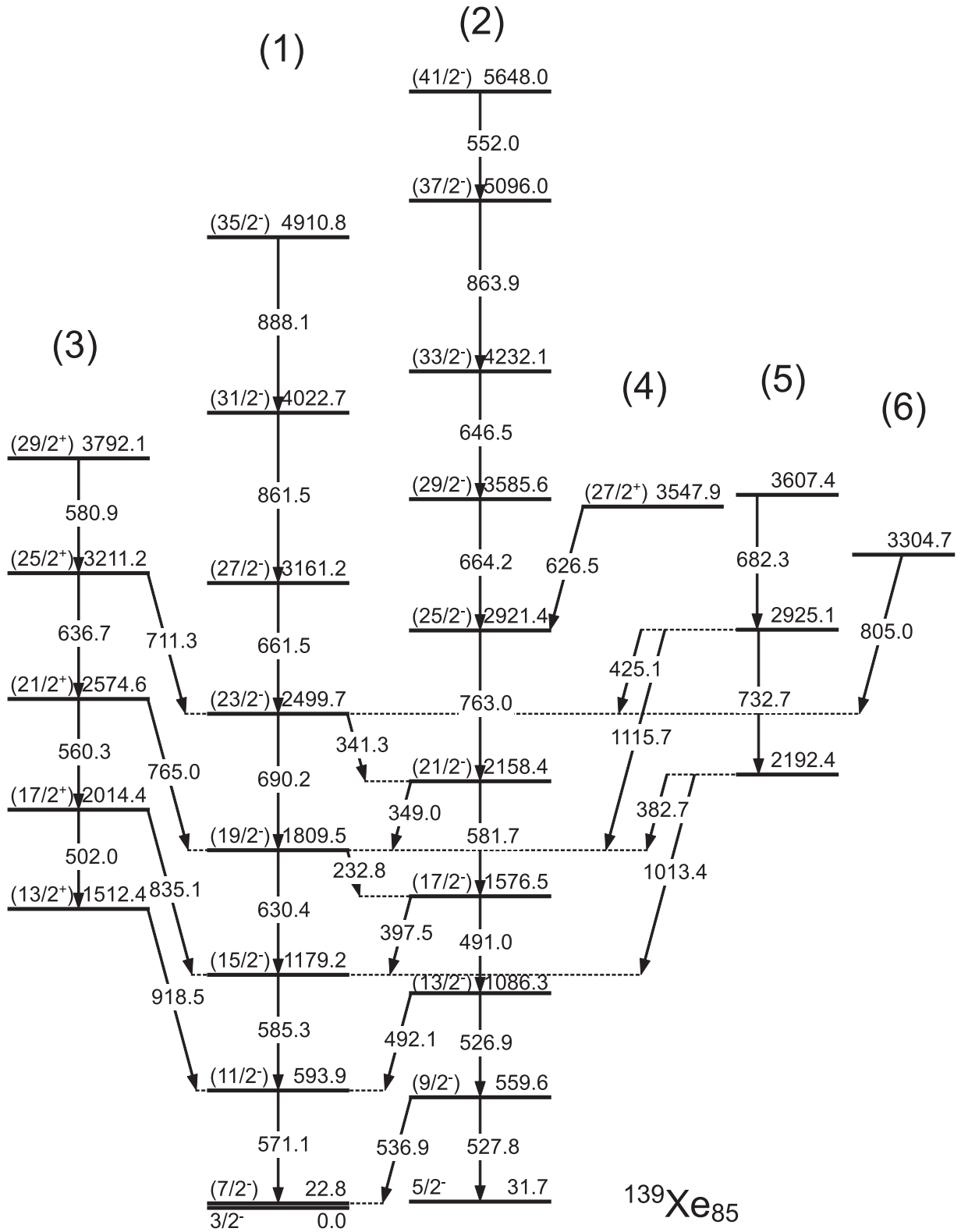
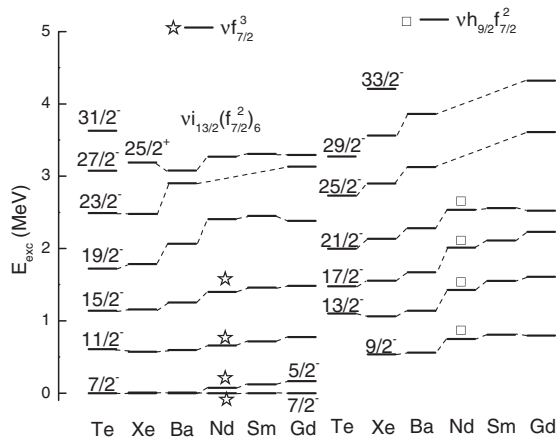FIG. 4. Level scheme showing levels and transitions in ^{139}Xe.

FIG. 5. Two negative-parity bands of the $N = 85$ even-odd isotones. The Xe and Ba levels are normalized to the $(7/2^-)$ and $(5/2^-)$ levels, respectively. This figure is the correct version of Fig. 5 of the original paper.
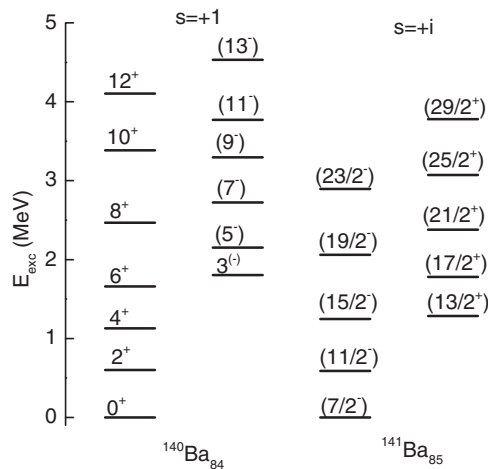

FIG. 6. Comparison of yrast bands in ^{140,141}Ba. The ^{141}Ba levels are normalized to the $(7/2^-)$ levels. This figure is the correct version of Fig. 6 of the original paper.
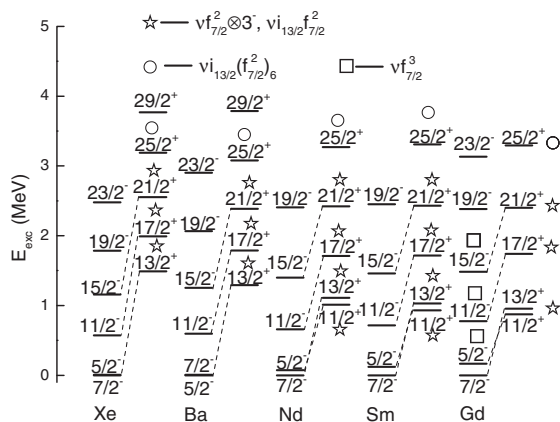

FIG. 8. Levels of the lower-lying positive-parity bands of the $N = 85$ isotones. The ^{139}Xe and ^{141}Ba levels are normalized to their $7/2^-$ and $5/2^-$ levels, respectively. This figure is the correct version of Fig. 8 of the original paper.
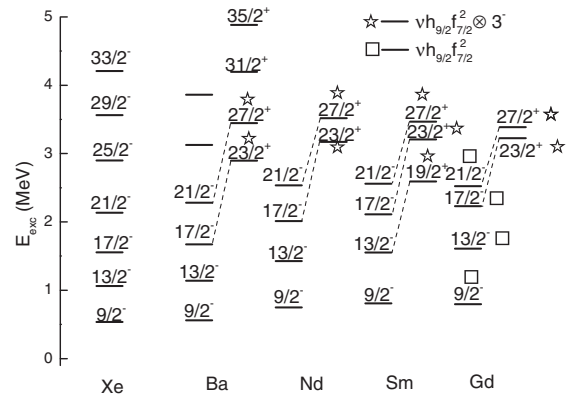

FIG. 9. Levels of the higher-lying positive-parity bands of the $N = 85$ isotones. The ^{139}Xe and ^{141}Ba levels are normalized to their $7/2^-$ and $5/2^-$ levels, respectively. This figure is the correct version of Fig. 9 of the original paper.

at the correct energies. The $13/2^-$, $17/2^-$, and $21/2^-$ levels in ^{141}Ba were not labeled at the correct energies either. The neutron symbol was not labeled with the correct greek letter in the figure. In this Erratum, the correct figure is shown in Fig. 9.

(5) In Fig. 10 of the original paper, the $13/2^-$ state of ^{139}Xe was not labeled at the correct energy. In this Erratum, the correct figure is shown in Fig. 10.

We thank the data scientists at the Nuclear Data Review Group, NNDC, Brookhaven National Laboratory for bringing to our attention the need to recalculate the level energies, and the Physical Review C editors for their advice on how to address and report the pertinent corrections.
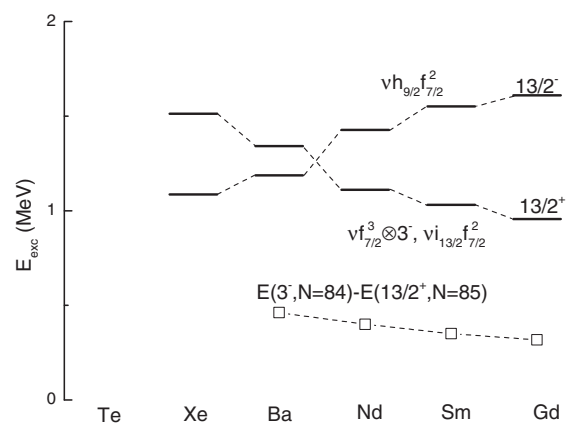

FIG. 10. The $13/2^+$ and $13/2^-$ states of the $N = 85$ isotones. The energy differences between the 3^- states of the $N = 84$ isotones and the $13/2^+$ states of the $N = 85$ isotones are also shown. This figure is the correct version of Fig. 10 of the original paper.