Erratum: Transverse asymmetry of γ rays from neutron-induced compound states of ^{140}La [Phys. Rev. C 101, 064624 (2020)]

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We correct the sign of the traverse asymmetry A_{LR} in our previous paper The transverse asymmetry is derived from the correlation term $\sigma_n k_\gamma$, where σ_n and k_γ are polarization of incident neutrons and momentum of emitted γ rays, respectively. The neutron polarization direction was determined using two measurements: (1) the measurement of the polarization direction of the circularly polarized laser which is used to polarize the ^{3}He nuclei of the neutron polarizer, and (2) the measurement of the neutron polarization direction as it passes through the ^{3}He neutron polarizer using a magnetic supermirror. However, in (1), the relation between the direction of the circular polarization and the spin of photons was misevaluated. Additionally, in (2), the relation between the neutron polarization direction reflected by the magnetic supermirror and the magnetic field applied to the magnetic supermirror was also misevaluated. Upon reevaluation we have deduced that the neutron polarization direction during the experiment was opposite to what was previously reported, and, hence, the sign of A_{LR} should be reversed. As supporting evidence, the direction of the circular polarization of our laser system was obtained by measuring the electric paramagnetic resonance signal of Rb during laser pumping. The neutron polarization direction was also determined from the measurement of the parity violation at the 0.74-eV p-wave resonance of ^{139}La $+ n$ using our ^{3}He neutron polarizer. These results also support that the neutron polarization direction was opposite to what was previously reported.

Consequently, the transverse asymmetries for γ rays emitted in the transition from the 0.74-eV p-wave resonance to the ground state and inclusive γ rays are newly obtained as $A_{\mathrm{LR}}^{\mathrm{gnd}} = -0.60 \pm 0.19$ and $A_{\mathrm{LR}}^{\mathrm{inc}} = -0.0045 \pm 0.0080$, respectively. Similarly, Figs. 9, 11, 13, and 15 in the original paper should be replaced as Figs. 9, 11, 13, and 15 in this Erratum, respectively. The corrections do not affect results and conclusions of the original article.
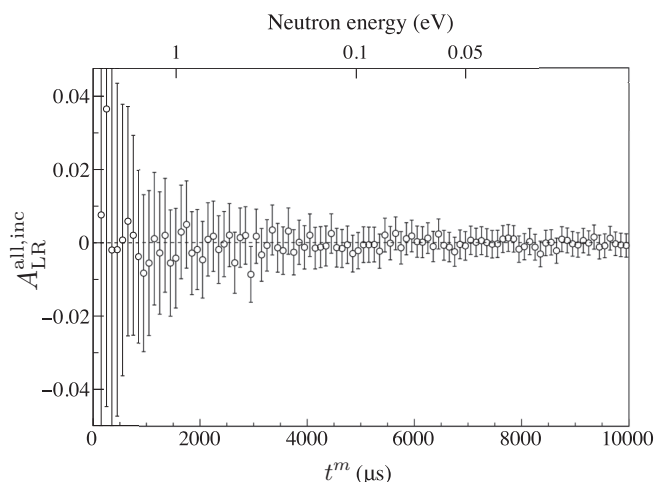

FIG. 9. White points show the asymmetry for the entire region when the threshold of the γ ray was set to 2000–15 000 keV.
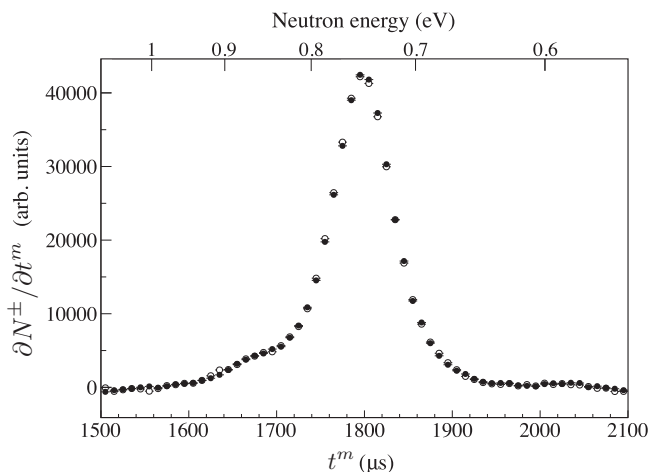

FIG. 11. γ-ray yield in the vicinity of the p-wave resonance for each polarization direction of incident neutrons. White and black points indicate the up- and down-polarizations, respectively.
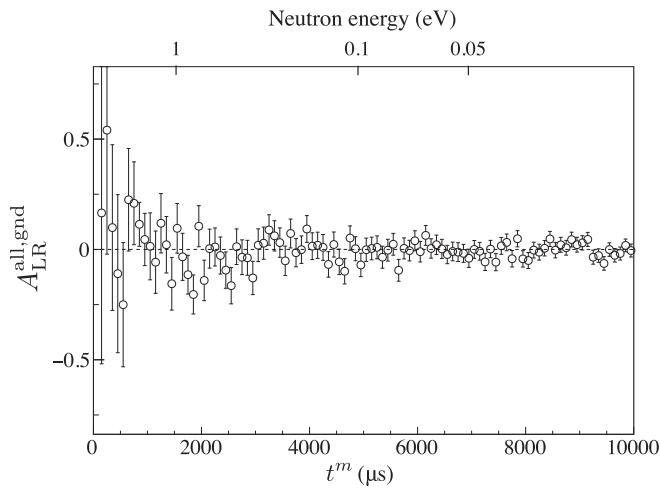
FIG. 13. White points show the asymmetry for the entire region for the 5161-keV single γ-ray transition.
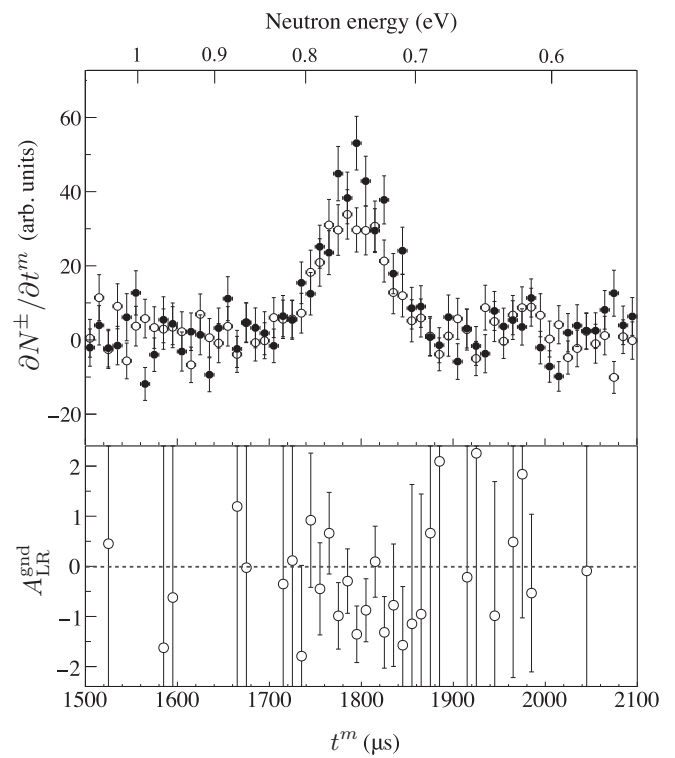
FIG. 15. γ-ray yield in the vicinity of the p-wave resonance for each polarization direction of incident neutrons and the transverse asymmetry time-of-flight spectrum. In the upper portion of the figure, white and black points indicate the up- and down-polarizations, respectively.