Erratum: The ^{8}Li(p, α)^{5}He reaction at low energies, and ^{9}Be spectroscopy around the proton threshold [Phys. Rev. C 86, 064321 (2012)]

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In Sec. II D, p. 5, of the original paper, the differential cross section was unnecessarily multiplied by the derivative $\frac{dE(^8\mathrm{Li})}{dE(\alpha)}$ due to the conversion from α-particle energy to ^{8}Li energy. This would be correct if the yield was obtained from the sum of counts in a peak where the height of the peak depends on the binning as well as the yield. In the thick-target inverse kinematics (TTIK) method, the yield is given directly by the counts in a channel and does not depend on the binning [1]. For this reason, in the TTIK case, the cross section should not be multiplied by the derivative $\frac{dE(^8\mathrm{Li})}{dE(\alpha)}$. This unnecessary multiplication affects the results presented in Figs. 5–9 and the R-matrix fit with parameters presented in Table II of the original paper. The equation below presents the energy dependence of this derivative,

$$\frac{dE(^8\mathrm{Li})}{dE(\alpha)} = 0.716(1) + 0.4205(15)E_{\mathrm{c.m.}}/\mathrm{MeV} - 0.0413(6)(E_{\mathrm{c.m.}}/\mathrm{MeV})^2. \quad (1)$$

This factor varies between 0.80 at $E_{\mathrm{c.m.}} = 0.22$ MeV and 1.28 at $E_{\mathrm{c.m.}} = 1.70$ MeV, crossing the value of 1.00 at $E_{\mathrm{c.m.}} = 0.77$ MeV. The removal of this factor increases the cross section below $E_{\mathrm{c.m.}} = 0.77$ MeV and reduces at the large resonance observed at $E_{\mathrm{c.m.}} = 1.7$ MeV by 28%.

Equation (1) of the original paper contains the unnecessary multiplying factor of $\frac{dE(^8\mathrm{Li})}{dE(\alpha)}$, which has to be removed. The complete equation, which describes the cross section, is reprinted here,

$$\frac{d\sigma}{d\Omega}(E,\theta)_{\mathrm{c.m.}} = \frac{NJ\frac{dE}{dx}}{\Delta\Omega N_{\mathrm{inc}}\Delta E(^8\mathrm{Li})}, \quad (2)$$

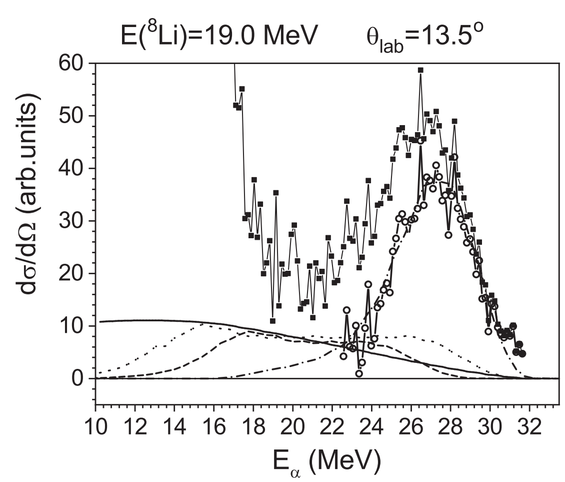

FIG. 5. The experimental cross sections measured at $E(^8\mathrm{Li}) = 19.0$ MeV (line with squares) are compared to the continuous energy distribution of the α particles resulting from the three-body breakup (solid line) and to the energy spectra of the α particles resulting, respectively, from the decay of $^5\mathrm{He}_{\mathrm{g.s.}}$ (dashed line) and of $^5\mathrm{He}^*$ (dotted line). The simulation assumes a Breit-Wigner resonance situated at $E(^8\mathrm{Li}) = 15.3$ MeV with $\Gamma = 0.7$ MeV (dashed-dotted line). The cross section obtained after the subtraction of all three background contributions is represented by circles. The error bars are omitted for the sake of clarity.

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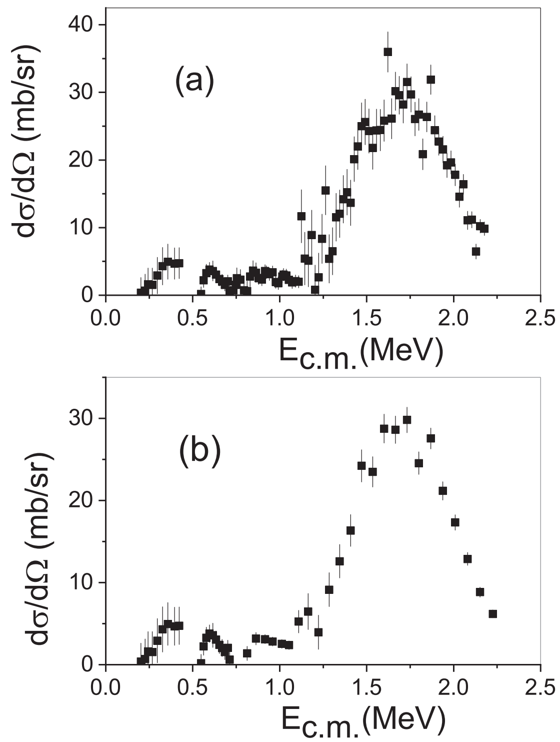

FIG. 6. Complete excitation function at $\theta_{\rm lab} = 13.5^{\circ}$ (a) without an average and (b) with an average procedure. See the text for details.

The text on p. 5, column 1, last paragraph after Eq. (1) of the original paper, should be changed to:
"where N is the total number of α particles detected with energy corresponding to the interval E and $E + \Delta E(^{8}\mathrm{Li})$. $\Delta\Omega$ is the solid angle of the detector considered, $N_{\rm inc}$ is the number of ^{8}Li ions incident on the secondary target, and J is the Jacobian that converts the geometrical solid angle from the laboratory frame to the center-of-mass frame."

In Figs. 5–7 of the original paper, the experimental cross section was multiplied unnecessarily by the derivative. The complete Figs. 5 and 6 are reprinted here. Figure 7 contains R-matrix calculations to fit the cross sections of the original paper with parameters shown in Table II of the original paper. We do not refit the corrected data since this fit is overcome by calculations in the new article [2]. Thus, readers should disregard Fig. 7 and Table II of the original paper.

In Fig. 8 of the original paper, the integrated cross section and the astrophysical S factor are presented. Both of them should be divided by the factor of $\frac{dE(^{8}\mathrm{Li})}{dE(\alpha)}$, which would mean an increase at low energies and a decrease at the large resonance at 1.7 MeV.

In Fig. 9 of the original paper, the astrophysical reaction rate was calculated, summing the resonance contribution to a nonresonant part. The modification of the resonance contribution should produce a smaller change than to quoted values between 20 and 30%.

The results of the original paper are slightly affected but not the conclusions.

[1] G. Rogachev, E. Johnson, J. Mitchell, V. Goldberg, K. Kemper, and I. Wiedenhover, in *Fifth European Summer School on Experimental Nuclear Astrophysics*, edited by C. Spitaleri, C. Rolfs, and R. G. Pizzone, AIP Conf. Proc. No. 1213 (AIP, New York, 2010), p. 137.

[2] E. Leistenschneider *et al.*, Phys. Rev. C **98**, 064601 (2018).