Erratum: Surface direct nuclear photoeffect in heavy deformed nuclei [Phys. Rev. C 94, 054623 (2016)]

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During preparation of an updated version of the model of direct surface nuclear photoeffect (SDNP) on deformed nuclei described in the present paper, we have found a software bug in the program that was used to calculate the cross sections in this paper. In the process of a numerical solution of the algebraic system of coupled-channel equations (28) and (29) using a standard library routine the matrix of the system was being errorneously overwritten with temporary values. As a result, the calculated cross sections of the direct surface photoeffect on ^{160}Gd and ^{184,186}W shown in Figs. 2–4 were incorrectly large. Corrected versions of these figures obtained after correction of the bug and calculation of the cross sections (using the same input parameters as in the original publication) are shown in the corresponding Figs. 2–4 in this Erratum.

As can be seen from Figs. 2–4, the corrected cross sections for direct proton knockout from the last filled level of the target nucleus are an order of magnitude smaller than the deficit of the theoretical cross section for the (γ, p) reaction. Therefore, the conclusion made in this paper about the significance of the contribution of these cross sections to the total cross section of the (γ, p) reaction is incorrect. In fact, the above calculation indicates the need to take into account the direct knockout of nucleons in heavy deformed nuclei from several single-particle levels located in the vicinity of the Fermi surface.

It must be emphasized that the error was present only in the software implementation of the model, and the obtained equations remain valid.

*Deceased.

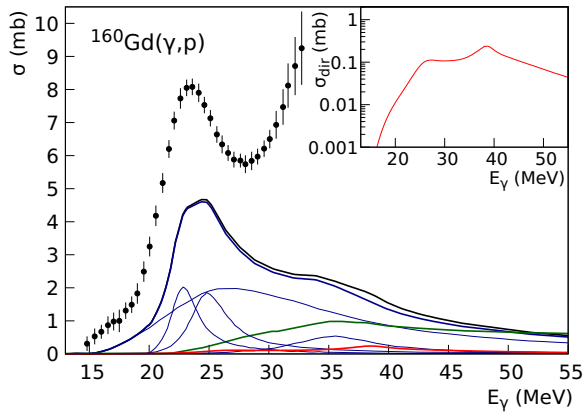

FIG. 2. The inset: Calculated surface direct nuclear photoeffect (SDNP) cross section of the (γ, p) reaction on ^{160}Gd without averaging; black circles with statistical errors: experimental cross section of the $(\gamma, p)^*$ reaction [36]; blue and green thick lines: cross sections of, respectively, the (γ, p) and (γ, np) reactions proceeding through decay of composite state calculated using the combined model [38]; red line: SDNP cross section of (γ, p); black line: resulting theoretical estimate of the $(\gamma, p)^*$ cross section. Thin blue solid, dotted, dashed, dashed-dot curves show separate components of the decay cross section of (γ, p): respectively, the $T_<$ component of the giant dipole resonance (GDR), the $T_>$ component, the isovector quadrupole resonance, and the GDR overtone [38].

In addition, a typographical error was found in Eq. (8), where the factor of 4 was missing in the right-hand side. The correct form of the expression should read

$$\frac{d\sigma(E_\gamma, \vartheta)}{d\Omega} = \frac{4\pi^2}{6}\frac{E_\gamma e_{\text{eff}}^2}{c\hbar}\{A_0 + A_2 P_2(\cos\vartheta)\}. \tag{8}$$

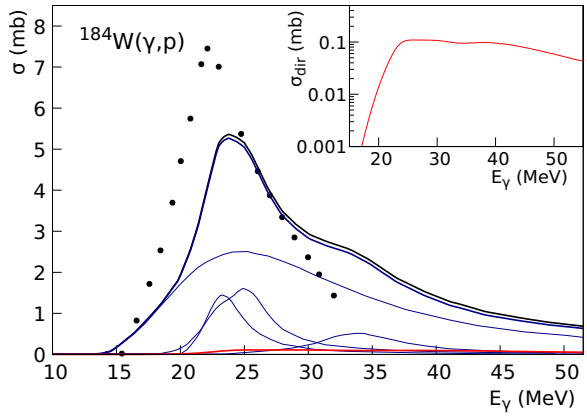

FIG. 3. Comparison of the experimental [35] and calculated cross sections of the (γ, p) reaction on ^{184}W. The same notation as in Fig. 2.

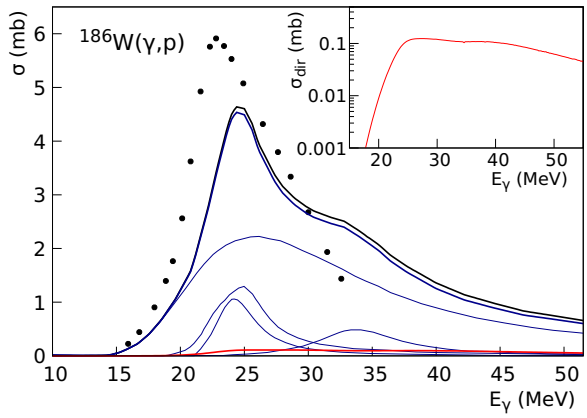

FIG. 4. Comparison of the experimental [35] and calculated cross sections of the (γ, p) reaction on ^{186}W. The same notation as in Fig. 2.

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