Corrigendum

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Parity-nonconserving effects in n–p capture at thermal energies

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As a result of discussions which one of us (B.H.J.McK.) has had with B. Desplanques and H. J. Pirner, we have discovered an error in sign in some of our results: all numerical values of λ_s, λ_t, C, P_γ and α are of the wrong sign. This error is due, in part, to a misunderstanding of Danilov's (1965) paper, in which his relative momenta are defined as

$$\boldsymbol{k} = \tfrac{1}{2}(\boldsymbol{k}_n - \boldsymbol{k}_p),$$

while we have adopted the opposite definition of $\boldsymbol{k}$ in our work, namely

$$\boldsymbol{k} = \tfrac{1}{2}(\boldsymbol{k}_p - \boldsymbol{k}_n).$$

Thus, in order to retain the same definitions of λ_s, λ_t and C as Danilov's, equation (7b) should be replaced by

$$f_{\mathrm{PNC}}(\boldsymbol{k}', \boldsymbol{k}) = C a_t(\boldsymbol{\sigma}_p + \boldsymbol{\sigma}_n) . (\boldsymbol{k}' + \boldsymbol{k}) + (\boldsymbol{\sigma}_p - \boldsymbol{\sigma}_n) . \{\lambda_t a_t(\boldsymbol{k}' P_t + \boldsymbol{k} P_s) + \lambda_s a_s(\boldsymbol{k}' P_s + \boldsymbol{k} P_t)\}, \tag{7b}$$

and equations (A7) by

$$a_t C = (\pi M/4\hbar^2)\sqrt{\tfrac{3}{2}}\, R^1_{01,11}(0), \tag{A7a}$$

$$a_{2S+1}\lambda_{2S+1} = (\pi M/4\hbar^2)(-)^S\, \hat{S}\, R^S_{0S,1S'}(0); \tag{A7b}$$

equations (8) remain unchanged and an additional minus sign explicitly enters equations (9). A misplacement in the subscripts of R has also been corrected in this re-expression of equations (A7).

Table 1. Spin–isospin reduced matrix elements

Values are given of the spin–isospin reduced matrix elements $w_i^{(\pm)}(S, T)$ of equation (5), corresponding to the operators $v_i^{(\pm)}$ of (4). The isovector matrix elements assume an isosinglet state $|0, 0\rangle = \sqrt{\tfrac{1}{2}}(|\mathrm{p,n}\rangle - |\mathrm{n,p}\rangle)$

Index i	$v_i^{(\pm)}$	$\pm$	ΔT	ΔS	$w_i^{(\pm)}(S,T)$
1	$(\boldsymbol{\sigma}^{(1)}+\boldsymbol{\sigma}^{(2)})T_{12}^{(-)}$	$-$	1	0	$2\sqrt{\tfrac{2}{3}}(-1)^T$
2	$\boldsymbol{\sigma}^{(1)}\tau_0^{(1)} - \boldsymbol{\sigma}^{(2)}\tau_0^{(2)}$	+	1	0	$-2\sqrt{\tfrac{2}{3}}$
3	$\boldsymbol{\sigma}^{(1)}\tau_0^{(2)} - \boldsymbol{\sigma}^{(2)}\tau_0^{(1)}$	+	1	0	$2\sqrt{\tfrac{2}{3}}$
4	$(\boldsymbol{\sigma}^{(1)}-\boldsymbol{\sigma}^{(2)})T_{12}^{(+)}$	+	0	1	$2(-1)^{T+1}$
5	$(\boldsymbol{\sigma}^{(1)}-\boldsymbol{\sigma}^{(2)})\tau_0^{(1)}\tau_0^{(2)}$	+	0	1	-2
6	$(\boldsymbol{\sigma}^{(1)}-\boldsymbol{\sigma}^{(2)})$	+	0	1	2
7	$\mathrm{i}(\boldsymbol{\sigma}^{(1)}\times\boldsymbol{\sigma}^{(2)})T_{12}^{(+)}$	$-$	0	1	$2(-1)^{S+T+1}$
8	$\mathrm{i}(\boldsymbol{\sigma}^{(1)}\times\boldsymbol{\sigma}^{(2)})\tau_0^{(1)}\tau_0^{(2)}$	$-$	0	1	$2(-1)^{S+1}$
9	$\mathrm{i}(\boldsymbol{\sigma}^{(1)}\times\boldsymbol{\sigma}^{(2)})$	$-$	0	1	$2(-1)^S$

Since we feel that many readers would find useful a tabulation of the reduced matrix elements $w_i^{(\pm)}(S, T)$, we present them here in Table 1.

We point out one further inconsistency: the calculations employing the Lee model use a parameter A of opposite sign to that cited in Table 2 of our paper. Furthermore, the parameters quoted in Table 2 for the Brunet model, and calculations performed with them, are unreliable.

In addition to the above inconsistencies we have learned (Desplanques, personal communication) that Danilov's (1971) dispersion calculations also led to values of λ_1, λ_2 and C of opposite sign to those cited by Danilov. Thus agreement between our work and Danilov's is not destroyed.

Finally, the errors discussed herein also pertain to the preliminary account of our work (Lassey and McKellar 1974).

Acknowledgments

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References

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