Erratum: Exact results for polaron and molecule in one-dimensional spin-1/2 Fermi gas [Phys. Rev. A 94, 043645 (2016)]

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(Received 26 January 2024; published 30 April 2024)

DOI: 10.1103/PhysRevA.109.049905

Equations (2)–(4) are correct only for the case where the total particle number N is odd. For even N, a factor $(-1)^{l+1}$ should be added in front of the determinant in the summation in Eq. (2), namely,

$$f_{\downarrow_N}(x_1, x_2, \dots, x_N) = \sum_{l=1}^{N} (-1)^{l+1} \begin{vmatrix} a_{11} & \cdots & a_{1,N-1} \\ \cdot & \cdot & \cdot \\ \cdot & a_{ij} & \cdot \\ \cdot & \cdot & \cdot \\ a_{N-1,1} & \cdots & a_{N-1,N-1} \end{vmatrix} e^{ik_l x_N}, \tag{2}$$

where

$$a_{ij} = [k_{l+j} - \lambda + ic' \text{sgn}(x_N - x_i)] e^{ik_{l+j} x_i} \tag{3}$$

if $l + j \leqslant N$; for other cases,

$$a_{ij} = [k_{l+j-n} - \lambda + ic' \text{sgn}(x_N - x_i)] e^{ik_{l+j-N} x_i}. \tag{4}$$

Similarly, for Eq. (A1), minus signs should be added to the second and fourth terms so that the equation becomes

$$\begin{aligned} f_{\downarrow_4}(x_1, x_2, x_3, x_4) = & \begin{vmatrix} (k_2 - \tilde{\lambda}) e^{ik_2 x_1} & (k_3 - \tilde{\lambda}) e^{ik_3 x_1} & (k_4 - \tilde{\lambda}) e^{ik_4 x_1} \\ (k_2 - \tilde{\lambda}) e^{ik_2 x_2} & (k_3 - \tilde{\lambda}) e^{ik_3 x_2} & (k_4 - \tilde{\lambda}) e^{ik_4 x_2} \\ (k_2 - \tilde{\lambda}) e^{ik_2 x_3} & (k_3 - \tilde{\lambda}) e^{ik_3 x_3} & (k_4 - \tilde{\lambda}) e^{ik_4 x_3} \end{vmatrix} e^{ik_1 x_4} \\ & - \begin{vmatrix} (k_3 - \tilde{\lambda}) e^{ik_3 x_1} & (k_4 - \tilde{\lambda}) e^{ik_4 x_1} & (k_1 - \tilde{\lambda}) e^{ik_1 x_1} \\ (k_3 - \tilde{\lambda}) e^{ik_3 x_2} & (k_4 - \tilde{\lambda}) e^{ik_4 x_2} & (k_1 - \tilde{\lambda}) e^{ik_1 x_2} \\ (k_3 - \tilde{\lambda}) e^{ik_3 x_3} & (k_4 - \tilde{\lambda}) e^{ik_4 x_3} & (k_1 - \tilde{\lambda}) e^{ik_1 x_3} \end{vmatrix} e^{ik_2 x_4} \\ & + \begin{vmatrix} (k_4 - \tilde{\lambda}) e^{ik_4 x_1} & (k_1 - \tilde{\lambda}) e^{ik_1 x_1} & (k_2 - \tilde{\lambda}) e^{ik_2 x_1} \\ (k_4 - \tilde{\lambda}) e^{ik_4 x_2} & (k_1 - \tilde{\lambda}) e^{ik_1 x_2} & (k_2 - \tilde{\lambda}) e^{ik_2 x_2} \\ (k_4 - \tilde{\lambda}) e^{ik_4 x_3} & (k_1 - \tilde{\lambda}) e^{ik_1 x_3} & (k_2 - \tilde{\lambda}) e^{ik_2 x_3} \end{vmatrix} e^{ik_3 x_4} \\ & - \begin{vmatrix} (k_1 - \tilde{\lambda}) e^{ik_1 x_1} & (k_2 - \tilde{\lambda}) e^{ik_2 x_1} & (k_3 - \tilde{\lambda}) e^{ik_3 x_1} \\ (k_1 - \tilde{\lambda}) e^{ik_1 x_2} & (k_2 - \tilde{\lambda}) e^{ik_2 x_2} & (k_3 - \tilde{\lambda}) e^{ik_3 x_2} \\ (k_1 - \tilde{\lambda}) e^{ik_1 x_3} & (k_2 - \tilde{\lambda}) e^{ik_2 x_3} & (k_3 - \tilde{\lambda}) e^{ik_3 x_3} \end{vmatrix} e^{ik_4 x_4}. \end{aligned} \tag{A1}$$

This was also confirmed in Eq. (7) in Ref. [1].

We thank Xiangguo Yin and Giuliano Orso for helpful discussion on the form of the wave function (2).

[1] M. Chang, X. Yin, L. Chen, and Y. Zhang, Phys. Rev. A **107**, 053312 (2023).

