Erratum: Fermion propagator in a rotating environment **[Phys. Rev. D 103, 076021 (2021)]**

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The correct version of Eq. (2) must be

$$[i\gamma^\mu(\partial_\mu + \Gamma_\mu) - m]\psi = 0, \quad (1)$$

while the anticommutation relation in Eq. (6) should read:

$$\{\gamma^\mu, \gamma^\nu\} = 2g^{\mu\nu}. \quad (2)$$

The computation of the fermion propagator in this paper contains an error in Eq. (38). The correct closure relation satisfied by the eigenfunctions $\phi_\lambda(x)$ should be given by

$$\sum_\lambda \phi_\lambda(x) \phi_\lambda^\dagger(x') \equiv \sum_{\ell=-\infty}^{\infty} \int \frac{dE dk_z dk_\perp k_\perp}{(2\pi)^3} \phi(x) \phi^\dagger(x') = \begin{pmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \end{pmatrix} \delta^4(x - x'), \quad (3)$$

which should have then been used instead of Eq. (42). Therefore, the correct definition of the function $\Phi(\rho, \rho')$ becomes

$$\Phi(\rho, \rho') = \begin{pmatrix} \mathcal{A}\mathcal{J}_{\ell,\ell} & \mathcal{A}\mathcal{J}_{\ell,\ell+1}e^{-i\phi'} & \mathcal{A}\mathcal{J}_{\ell,\ell} & \mathcal{A}\mathcal{J}_{\ell,\ell+1}e^{-i\phi'} \\ \mathcal{B}\mathcal{J}_{\ell+1,\ell}e^{i\phi} & \mathcal{B}\mathcal{J}_{\ell+1,\ell+1}e^{i(\phi-\phi')} & \mathcal{B}\mathcal{J}_{\ell+1,\ell}e^{i\phi} & \mathcal{B}\mathcal{J}_{\ell+1,\ell+1}e^{i(\phi-\phi')} \\ \mathcal{C}\mathcal{J}_{\ell,\ell} & \mathcal{C}\mathcal{J}_{\ell,\ell+1}e^{-i\phi'} & \mathcal{C}\mathcal{J}_{\ell,\ell} & \mathcal{C}\mathcal{J}_{\ell,\ell+1}e^{-i\phi'} \\ \mathcal{D}\mathcal{J}_{\ell+1,\ell}e^{i\phi} & \mathcal{D}\mathcal{J}_{\ell+1,\ell+1}e^{i(\phi-\phi')} & \mathcal{D}\mathcal{J}_{\ell+1,\ell}e^{i\phi} & \mathcal{D}\mathcal{J}_{\ell+1,\ell+1}e^{i(\phi-\phi')} \end{pmatrix}, \quad (4)$$

where

$$\begin{aligned} \mathcal{A} &\equiv [E + m - k_z + ik_\perp], \\ \mathcal{B} &\equiv [E + m + k_z - ik_\perp], \\ \mathcal{C} &\equiv [-E + m + k_z - ik_\perp], \\ \mathcal{D} &\equiv [-E + m - k_z + ik_\perp], \end{aligned} \quad (5)$$

and

$$\mathcal{J}_{\ell,\ell'} \equiv J_\ell(k_\perp \rho) J_{\ell'}(k_\perp \rho'). \quad (6)$$

Using the orthogonality properties of the Bessel functions, the matrix in Eq. (4) can be simplified to become

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$$\Phi(\rho, \rho') = \begin{pmatrix} \mathcal{A}\mathcal{J}_{\ell, \ell} & 0 & \mathcal{A}\mathcal{J}_{\ell, \ell} & 0 \\ 0 & \mathcal{B}\mathcal{J}_{\ell+1, \ell+1} e^{i(\phi-\phi')} & 0 & \mathcal{B}\mathcal{J}_{\ell+1, \ell+1} e^{i(\phi-\phi')} \\ \mathcal{C}\mathcal{J}_{\ell, \ell} & 0 & \mathcal{C}\mathcal{J}_{\ell, \ell} & 0 \\ 0 & \mathcal{D}\mathcal{J}_{\ell+1, \ell+1} e^{i(\phi-\phi')} & 0 & \mathcal{D}\mathcal{J}_{\ell+1, \ell+1} e^{i(\phi-\phi')} \end{pmatrix}. \quad (7)$$

Carrying out the integration and the sum in Eq. (45), Eq. (57) should be written as

$$S(p) = \begin{pmatrix} \frac{p_0 + \Omega/2 - p_z + m + ip_\perp}{(p_0 + \Omega/2)^2 - \bar{p}^2 - m^2 + i\epsilon} & 0 & \frac{p_0 + \Omega/2 - p_z + m + ip_\perp}{(p_0 + \Omega/2)^2 - \bar{p}^2 - m^2 + i\epsilon} & 0 \\ 0 & \frac{p_0 - \Omega/2 + p_z + m - ip_\perp}{(p_0 - \Omega/2)^2 - \bar{p}^2 - m^2 + i\epsilon} & 0 & \frac{p_0 - \Omega/2 + p_z + m - ip_\perp}{(p_0 - \Omega/2)^2 - \bar{p}^2 - m^2 + i\epsilon} \\ \frac{-(p_0 + \Omega/2) + p_z + m - ip_\perp}{(p_0 + \Omega/2)^2 - \bar{p}^2 - m^2 + i\epsilon} & 0 & \frac{-(p_0 + \Omega/2) + p_z + m - ip_\perp}{(p_0 + \Omega/2)^2 - \bar{p}^2 - m^2 + i\epsilon} & 0 \\ 0 & \frac{-(p_0 - \Omega/2) - p_z + m + ip_\perp}{(p_0 - \Omega/2)^2 - \bar{p}^2 - m^2 + i\epsilon} & 0 & \frac{-(p_0 - \Omega/2) - p_z + m + ip_\perp}{(p_0 - \Omega/2)^2 - \bar{p}^2 - m^2 + i\epsilon} \end{pmatrix}. \quad (8)$$

Equation (8) is the correct expression for the fermion propagator. Furthermore, this can be written in terms of Dirac gamma matrices and the operators $\mathcal{O}^\pm$, defined in Eq. (58), as

$$S(p) = \frac{(p_0 + \Omega/2 - p_z + ip_\perp)(\gamma_0 + \gamma_3) + m(1 + \gamma_5)}{(p_0 + \Omega/2)^2 - \bar{p}^2 - m^2 + i\epsilon} \mathcal{O}^+ + \frac{(p_0 - \Omega/2 + p_z - ip_\perp)(\gamma_0 - \gamma_3) + m(1 + \gamma_5)}{(p_0 - \Omega/2)^2 - \bar{p}^2 - m^2 + i\epsilon} \mathcal{O}^-. \quad (9)$$