



OPEN Author Correction: Fractional Young double-slit numerical experiment with Gaussian wavepackets

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The original version of this Article contained errors in the Formalism section, where Equation 1 and the subsequent formula were incorrect and Equations 2–4 were omitted.

“The wavepacket propagation in the two-dimensional fractional Schrodinger equation formalism can be studied by using:

$$i \frac{\partial}{\partial t} \psi(x, y, t) = \left[\beta (-\Delta)^{\alpha/2} - \gamma |\psi(x, y, t)|^2 + V(x, y) \right] \psi(x, y, t) \quad (1)$$

where α , β , and γ are the fractional derivative order, Laplacian coefficient, and nonlinear interaction strength, respectively. We also have $\Delta = \partial^2/\partial x^2 + \partial^2/\partial y^2$.”

now reads:

“The wavepacket propagation in the two-dimensional fractional Schrodinger equation formalism can be studied by using:

$$i \frac{\partial \psi}{\partial t} = \left[\beta Q_R(x, y, t, \alpha) (-\Delta^2)^{\frac{\alpha}{2}} - \gamma |\psi(x, y, t)|^2 + M(x, y, p_x, p_y, t, \alpha) \right] \psi(x, y, t) \quad (1)$$

where α , β , and γ are the fractional derivative order, Laplacian coefficient, and nonlinear interaction strength, respectively. We also have $\Delta^2 = \partial^2/\partial x^2 + \partial^2/\partial y^2$. Also Q_R , and M are real and complex functions, respectively. Let us assume that

$$M(x, y, p_x, p_y, t, \alpha) = V(x, y) + i\beta Q_I(x, y, t, \alpha) (-\Delta^2)^{\frac{\alpha}{2}} \quad (2)$$

where the geometrical potential $V(x, y)$ is defined for the double slit problem, and $\beta Q_I(x, y, t, \alpha)$ is a real function that determines amplitude of imaginary part of the potential. By substituting Eq. (2) in Eq. (1), we have

$$i \frac{\partial \psi}{\partial t} = \left[\beta Q(x, y, t, \alpha) (-\Delta^2)^{\frac{\alpha}{2}} - \gamma |\psi(x, y, t)|^2 + V(x, y) \right] \psi(x, y, t) \quad (3)$$

where $Q(x, y, t, \alpha) = Q_R(x, y, t, \alpha) + iQ_I(x, y, t, \alpha)$.

Note that when $Q(x, y, t, \alpha) = \exp(2\pi i) = 1$, we obtain the usual NFSE. In this paper however, we investigated a more general case of $Q(x, y, t, \alpha)$ as follows

$$Q(x, y, t, \alpha) = \exp \left(\frac{i\pi\alpha}{2|g(x, y, t)|} (|g(x, y, t)| - g(x, y, t)) \right) \quad (4)$$

where $g(x, y, t) = -i \frac{\Delta \psi(x, y, t)}{\psi(x, y, t)}$ is a real function.”

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As a result, Equations 5–8 were originally listed as Equations 2–5.

The original Article has been corrected.



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