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

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Correction to: *Scientific Reports* https://doi.org/10.1038/s41598-020-76512-5, published online 10 November 2020

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:

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

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:

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

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

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

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

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

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

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

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

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

The original Article has been corrected.