



SDI FINAL EVALUATION FORM 1.1

PART 1:

Table with 2 columns: Field (Journal Name, Manuscript Number, Title of the Manuscript) and Value (British Journal of Mathematics & Computer Science, 2014_BJMCS_9248, Analytical solutions to the fractional Fisher equation by applying the fractional sub-equation method).

PART 2:

Table with 2 columns: FINAL EVALUATOR'S comments on revised paper (if any) and Authors' response to final evaluator's comments. The first column contains a critique of the fractional sub-equation method. The second column contains a detailed response with mathematical derivations and conclusions.



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$$\begin{aligned} D_t^\alpha u(x,t) - D_x^{2\alpha} u(x,t) &= \\ &= \frac{9}{8} - \frac{3}{2} \left(\tanh_\alpha \left[\frac{1}{2} \left(x + (-5)^{1/\alpha} t \right)^\alpha \right] \right) - \frac{3}{4} \left(\tanh_\alpha \left[\frac{1}{2} \left(x + (-5)^{1/\alpha} t \right)^\alpha \right] \right)^2 + \\ &\frac{3}{2} \left(\tanh_\alpha \left[\frac{1}{2} \left(x + (-5)^{1/\alpha} t \right)^\alpha \right] \right)^3 - \frac{3}{8} \left(\tanh_\alpha \left[\frac{1}{2} \left(x + (-5)^{1/\alpha} t \right)^\alpha \right] \right)^4 \\ &= 6u(1-u) \end{aligned}$$

and finally Eq. (23) is an analytical exact solution to the fractional Fisher equation (14). Following this procedure it can be shown that the other solutions obtained in the present work are also analytical exact solutions to the generalized fractional Fisher equation.

The sub-equation method was applied to obtain exact analytical solutions for some PDEs see for example:

Fan E. Soliton solutions for a generalized Hirota-Satsuma coupled KdV equation and a coupled MKdV equation. Phys. Lett. A. 2001;282(1-2):18-22.

Miao XJ, Zhang ZY. The modified (G'/G)-expansion method and traveling wave solutions of nonlinear the perturbed nonlinear Schrödinger's equation with Kerr law nonlinearity. Commun. Nonlinear Sci. Numer. Simulat. 2011;16(11):4259-4267.

And its fractional order extension

Zhang S, Zhang HQ. Fractional sub-equation method and its applications to nonlinear fractional PDEs. Phys. Lett. A. 2011;375(7):1069-1073.

Alzaidy JF. The fractional sub-equation method and exact analytical solutions for some nonlinear fractional PDEs. American Journal of Mathematical Analysis. 2013;1(1):14-19.

Alzaidy JF. Fractional sub-equation method and its applications to the space-time fractional differential equations in mathematical physics. British Journal of Mathematics & Computer Science. 2013;3(2):153-163.

Etc.

In these works the exact solutions were obtained and not an approximate analytical solution. Therefore the solutions here presented should be considered as the exact analytical solution for the generalized fractional Fisher equation and not only as approximated solutions. Therefore in this work there is no need to include any comparison with some approximated solutions to the generalized fractional Fisher equation. In the present work exact analytical exact solutions were obtained and these new solutions in further works would be taken as a starting point of comparison when ADM, HPM or other perturbative aproximative method would be applied.