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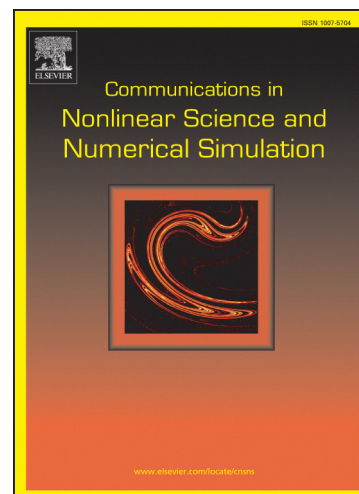
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# Exact separable solutions of delay reaction–diffusion equations and other nonlinear partial functional-differential equations

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## Abstract

We present a number of exact multiplicative and additive separable solutions to nonlinear delay reaction–diffusion equations of the form

$$u_t = ku_{xx} + F(u, w),$$

where  $u = u(x, t)$ ,  $w = u(x, t - \tau)$ , and  $\tau$  is the delay time. All of the equations involve one arbitrary function of one argument. We also give a number of exact solutions to more complex nonlinear partial functional-differential equations with a time-varying delay  $\tau = \tau(t)$  as well as to equations with several delay times. We extend the results to nonlinear partial differential-difference equations containing arbitrary linear differential operators of any order in the independent variables  $x$  and  $t$ ; in particular, these equations include the nonlinear delay Klein–Gordon equation.

*Keywords:* exact solutions, separable solutions, reaction-diffusion equations with delay, nonlinear equations, partial differential equations with delay, partial differential-difference equations, partial functional-differential equations, time-varying delay, delay hyperbolic equations, nonlinear Klein–Gordon equation

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