

1056-35-400

Ronald E Mickens* (rohrrs@math.gatech.edu), Physics Department, PO Box 1744, Atlanta, GA 30314. *Front Behavior for Traveling Wave Solutions of a Modified Fisher PDE.*

We consider a Fisher type PDE in which the reaction term includes both linear and square-root functions of the dependent variable, $u(x, t)$. While our previous work demonstrates the existence of traveling wave (TW) solutions for this equation, the purpose of this presentation is to show that these solutions go to zero at a finite value of the TW variable, $z = x - ct$. This means that $U(x, t) = f(z)$ has the properties:

$$0 \leq f(z) \leq 1,$$

$$f(-\infty) = 1, \quad f(\infty) = 0$$

$$f(z) = 0, \quad z \geq z_c,$$

where z_c is a constant. The method of “dominant” balance is used to calculate the behavior of $f(z)$ at the TW front, i.e., in a neighborhood of $z = z_c$. We also provide the details for the construction of a positivity preserving finite difference scheme that can be used to compute numerical solutions for the PDE. (Received September 04, 2009)