

1086-65-2478

**R. C. Harwood\*** (rharwood@georgefox.edu) and **V. S. Manoranjan.** *Oscillation-Free Stability Analysis for Linear and Semilinear Diffusion Equations.*

Techniques for developing oscillation-free numerical methods will be presented. Stability conditions for numerical solutions to linear diffusion equations may allow damped oscillatory behavior. While still stable, these oscillations can be removed by applying additional oscillation-free conditions to make the numerical solution more realistic. In semilinear diffusion equations, where a nonlinear reaction term is added, oscillatory behavior may create instabilities for certain reaction terms. Oscillation-free conditions will be presented from various approaches including Von Neumann analysis, monotonicity restrictions, and operator splitting techniques. (Received September 25, 2012)