HOPF BIFURCATION AND ITS COMPUTER SIMULATION FOR ONE-DIMENSIONAL MAXWELL'S MODEL

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One-dimensional system of nonlinear partial differential equations based on Maxwell's model is considered. The initial-boundary value problem with mixed type boundary conditions is discussed. It is proved that in some cases of nonlinearity there exists the critical value ψ_c of the boundary data such that for $0 < \psi < \psi_c$ the steady state solution of the studied problem is linearly stable, while for $\psi > \psi_c$ is unstable. It is shown that as ψ passes through ψ_c then the Hopf-like bifurcation may take place. The finite difference scheme is constructed. Various numerical experiments are carried out and discussed. These experiments agree with theoretical investigations.